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REQUEST FOR APPROVAL TO DISTRIBUTE DRAFT NAVY TRAINING
SYSTEMS PLAN (NTSP) FOR THE AIRCRAFT CARRIER (CV/CVN) VISUAL
LANDING AID (VLA) SYSTEMS, A-50-9202A/A

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1. Subject NTSP is approved and forwarded per reference (a).
2. Subsequent NTSP review will examine both the effectiveness and efficiency of training outlined in this document.
3. OPNAV point of contact is AZC (AW) M. S. Dean (N889H7), DSN 664-7714, Comm: (703) 604-7714.


I. M. VANDENBERG
Commander, U.S. Navy
Head, Aviation Technical Training Section

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APPROVED

NAVY TRAINING SYSTEM PLAN

FOR THE

AIRCRAFT CARRIER

VISUAL LANDING AID SYSTEMS

N88-NTSP-A-50-9202A/A

NOVEMBER 1999

AIRCRAFT CARRIER VISUAL LANDING AID SYSTEMS

EXECUTIVE SUMMARY

This Approved Navy Training System Plan (NTSP) has been developed to identify the life-cycle manpower, personnel, and training requirements associated with Aircraft Carrier (CV) Visual Landing Aid (VLA) Systems. The CV VLA Systems consist of the Flight Deck Centerline Light Sequence Flasher System (LSFS), Fresnel Lens Optical Landing System (FLOLS) MK-6 MOD 3, Improved Fresnel Lens Optical Landing System (IFLOLS), Integrated Launch And Recovery Television System (ILARTS) MK-8 MOD 0, Landing Signal Officer Heads Up Display (LSO HUD) MK-1 MOD 0, Improved Carrier Optical Landing System (ICOLS), Long Range Line-Up System (LRLS), Manually Operated Visual Landing Aid System (MOVLAS) MK-1 MOD 2, Virtual Imaging Systems For Approach and Landing (VISUAL), and the Wind Measuring Indicating System (WMIS). Manpower requirements identified in current Ship Manpower Documents (SMD) were used as the baseline for this NTSP.

The ICOLS is now called LRLS. LRLS is currently in Phase II of the acquisition process, going through Technical Evaluation (TECHEVAL) aboard the USS Carl Vinson (CVN-70). Operational Evaluation (OPEVAL) is not required for LRLS. LRLS is expected to reach Phase III of the acquisition process, (Production, Deployment, and Operational Support) in May 1999, with Initial Operational Capability (IOC) in March 2000. FLOLS is being replaced with IFLOLS. IFLOLS is currently in Phase II of the acquisition process, going through OPEVAL aboard the USS George Washington (CVN-73). IFLOLS is expected to reach Phase III of the acquisition process (Production, Deployment, and Operational Support) in April 1999, with IOC in October 2000. VISUAL is a new program that is currently in Phase I of the acquisition process, Program Definition and Risk Reduction. VISUAL is expected to complete Phase II of the acquisition process, Engineering and Manufacturing Development in FY02, with IOC in November 2003. ILARTS, Flight Deck Centerline LSFS, LSO HUD, MOVLAS, FLOLS, and WMIS are all post-IOC.

The VLAs used onboard aircraft carriers are being combined in this NTSP to ensure maintainer and operator manpower requirements are current. Manpower and training requirements for each system are displayed separately and combined to show there will be no change in manpower for commands and training facilities. These requirements will also provide justification for no change in student billets.

The addition of the LRLS, IFLOLS, and VISUAL will require no change to the existing organizational level Interior Communications Electrician (IC) or Electrician's Mate (EM) billet structures. These systems will be designed to minimize manning and will be capable of being operated and maintained by IC and EM personnel currently on board aircraft carriers.

AIRCRAFT CARRIER VISUAL LANDING AID SYSTEMS

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AIRCRAFT CARRIER VISUAL LANDING AID SYSTEMS

LIST OF ACRONYMS

ABE	Aviation Boatswain's Mate (Launching and Recovery Equipment)
ACLS	Automatic Carrier Landing System
AIMD	Aircraft Intermediate Maintenance Department
ALRE	Aircraft Launch and Recovery Equipment
AN	Airman
APARTS	Automated Performance Assessment and Readiness Training System
AT	Aviation Electronics Technician
BITE	Built-In Test Equipment
CAFSU	Carrier and Field Service Unit
CFE	Contractor Furnished Equipment
CIC	Combat Information Center
CINCPACFLT	Commander In Chief, United States Pacific Fleet
CM	Corrective Maintenance
CNET	Chief of Naval Education and Training
CNO	Chief of Naval Operations
COMNAVAIRESFOR	Commander, Naval Air Reserve Force
CV	Aircraft Carrier
CV-VLA	Aircraft Carrier Visual Landing Aid
CVN	Aircraft Carrier Nuclear
DET	Detachment
ECSS	Electronic Crosshair Stabilization System
EM	Electrician's Mate
FALANT	Farnsworth Lantern
FLOLS	Fresnel Lens Optical Landing System
FMS	Foreign Military Sales
FRS	Fleet Readiness Squadron
FTC	Fleet Training Center
FY	Fiscal Year
GFE	Government Furnished Equipment
GPETE	General Purpose Electronics Test Equipment
GPTE	General Purpose Test Equipment

AIRCRAFT CARRIER VISUAL LANDING AID SYSTEMS

LIST OF ACRONYMS

GQ	General Quarters
HUD	Heads-Up Display
IC	Interior Communications Electrician
ICOLS	Improved Carrier Optical Landing System
IFLOLS	Improved Fresnel Lens Optical Landing System
ILARTS	Integrated Launch and Recovery Television Surveillance System
ILSP	Integrated Logistics Support Plan
IOC	Initial Operational Capability
IPB	Illustrated Parts Breakdown
ISIT	Intensified Silicon Intensified Target
LRLS	Long Range Line-Up System
LSFS	Light Sequence Flasher System
LSO	Landing Signal Officer
LSO HUD	Landing Signal Officer Heads-Up Display
LT	Lieutenant
MIP	Maintenance Index Pages
MOVLAS	Manually Operated Visual Landing Aid System
MPT	Manpower, Personnel, and Training
MPTCD	Manpower, Personnel, and Training Concept Document
MRC	Maintenance Requirement Cards
MSD	Material Support Date
NAEC	Naval Air Engineering Center
NAS	Naval Air Station
NATC	Naval Air Test Center
NATEC	Naval Air Technical Data and Engineering Service Command
NATOPS	Naval Air Training and Operating Procedures Standardization
NATTC	Naval Air Technical Training Center
NAVAIRSYSCOM	Naval Air Systems Command
NAVICP	Naval Inventory Control Point
NAVSEASYS COM	Naval Sea Systems Command
NAWC AD	Naval Air Warfare Center Aircraft Division
NAWCADLKE	Naval Air Warfare Center Aircraft Division, Lakehurst
NEC	Navy Enlisted Classification

AIRCRAFT CARRIER VISUAL LANDING AID SYSTEMS

LIST OF ACRONYMS

NOBC	Navy Officer Billet Code
NPC	Naval Personnel Command
NSD	Navy Support Date
NTP	Navy Training Plan
NTSP	Navy Training System Plan
OJT	On-the-Job Training
OLSP	Operational Logistics Support Plan
OPEVAL	Operational Evaluation
OPNAVINST	Office of the Chief of Naval Operations Instruction
PLAT	Pilot Landing Aid Television
PM	Preventive Maintenance
PQS	Personnel Qualification Standards
PRI-FLY	Primary Flight
SINS	Ship's Inertial Navigation System
SMD	Ship Manpower Document
SME	Subject Matter Expert
SM&R	Source, Maintenance, and Recoverability
SPCC	Ships Parts Control Center
SPETE	Special Purpose Electronics Test Equipment
SPTE	Special Purpose Test Equipment
SSC	Service Schools Command
ST	Special Tool
TECHEVAL	Technical Evaluation
TMCR	Technical Manual Contract Requirement
TRACOM	Training Command
TRPPM	Training Planning Process Methodology
TTE	Technical Training Equipment
VCR	Video Cassette Recorder
VISUAL	Virtual Imaging Systems For Approach and Landing
VLA	Visual Landing Aid
WMIS	Wind Measuring Indicating System

AIRCRAFT CARRIER VISUAL LANDING AID SYSTEMS

PREFACE

This Approved Navy Training System Plan (NTSP) for the Aircraft Carrier (CV) Visual Landing Aid (VLA) Systems updates the Draft CV VLA NTSP, A-50-9202A/D, dated September 1998. Update of this document was accomplished through review of Manpower, Personnel, and Training (MPT) requirements associated with the CV VLA and includes updates to milestones, action items, points of contact, and incorporation of fleet comments.

PART I - TECHNICAL PROGRAM DATA

A. TITLE-NOMENCLATURE-PROGRAM

1. **Title-Nomenclature-Acronym.** Aircraft Carrier Visual Landing Aid Systems

2. **Program Element.** 0204161N

B. SECURITY CLASSIFICATION

1. **System Characteristics** Unclassified

2. **Capabilities** Unclassified

3. **Functions**..... Unclassified

C. MANPOWER, PERSONNEL, AND TRAINING PRINCIPALS

OPNAV Principal Official (OPO) Program Sponsor..... CNO (N885D)

OPO Resource Sponsor CNO (N885D)

Developing Agency..... NAVAIRSYSCOM (PMA251)

Training Agency CINCLANTFLT
CINCPACFLT
CNET

Training Support Agency NAVAIRSYSCOM (PMA205)

Manpower and Personnel Mission Sponsor CNO (N12)
NAVPERSCOM (NPC-40, NPC-402)

Director of Naval Training CNO (N7)

D. SYSTEM DESCRIPTION

1. **Operational Uses.** The Flight Deck Centerline Light Sequence Flasher System (LSFS), Fresnel Lens Optical Landing System (FLOLS) MK-6 MOD 3, Improved Fresnel Lens Optical Landing System (IFLOLS) MK13 MOD 0, Integrated Launch and Recovery Television Surveillance System (ILARTS), Landing Signal Officer Heads Up Display (LSO HUD) MK-1 MOD 0, Long Range Line-Up System (LRLS), Manually Operated Visual Landing Aid System

(MOVLAS) MK-1 MOD 2, Virtual Imaging Systems For Approach and Landing (VISUAL), and the Wind Measuring Indicating System (WMIS) are Aircraft Carrier (CV) Visual Landing Aid (VLA) Systems used to improve the safety and efficiency of recovering aircraft aboard CVs and Nuclear Aircraft Carriers (CVN).

2. Foreign Military Sales. At this time there are no Foreign Military Sales (FMS) planned for any CV VLA systems described in this NTSP.

E. DEVELOPMENTAL TEST AND OPERATIONAL TEST

1. Technical Evaluation

a. Flight Deck Centerline Light Sequence Flasher System. The Technical Evaluation (TECHEVAL) for the Flight Deck Centerline LSFS was successfully completed by the Naval Air Engineering Center (NAEC) in March 1988.

b. Fresnel Lens Optical Landing System MK-6 MOD 3. FLOLS MK-6 MOD3 updated the FLOLS MK-6 MOD 2 with the installation of Service Change Number 74A. This simple installation did not require a TECHEVAL.

c. Improved Fresnel Lens Optical Landing System MK-13 MOD 0. TECHEVAL for the IFLOLS was successfully completed in September 1996 at Naval Air Warfare Center Aircraft Division (NAWCAD) Patuxent River, Maryland, and onboard the USS George Washington (CVN-73) in March 1998.

d. Integrated Launch and Recovery Television Surveillance System. Service Changes incorporated the major subsystems of ILARTS in the 1980s. The TECHEVALs were successfully completed by the NAEC as each service change was incorporated.

e. Landing Signal Officer Heads Up Display MK-1 MOD 0. The TECHEVAL for LSO HUD was successfully completed by the NAEC in February 1976.

f. Long Range Line-Up System. TECHEVAL for the LRLS was conducted onboard the USS Carl Vinson (CVN-70) in November 1997. Further testing to complete shore based TECHEVAL is currently being conducted and will be completed in May 1999.

g. Manually Operated Visual Landing Aid System MK-1 MOD 2. TECHEVAL for the MOVLAS was successfully completed by the NAEC over 30 years ago.

h. Virtual Imaging Systems For Approach and Landing. TECHEVAL for VISUAL will be accomplished in FY02-03 during the Engineering and Manufacturing Development (EMD) phase of the VISUAL program.

i. Wind Measuring Indicating System. Naval Air Systems Command (NAVAIRSYSCOM) and Naval Sea Systems Command (NAVSEASYS COM) activities successfully completed TECHEVAL for WMIS equipment over the past 40 years.

2. Operational Evaluation

a. Flight Deck Centerline Light Sequence Flasher System. Formal Operational Evaluation (OPEVAL) was not required for the Flight Deck Centerline LSFS.

b. Fresnel Lens Optical Landing System MK-6 MOD 3. Initial operational test and evaluation of a prototype Carrier Landing Aid Stabilization System (CLASS) (MK-6 MOD 3) modification to the FLOLS MK-6 MOD 2 was unsuccessfully completed by the Naval Air Test Center (NATC), Patuxent River, and NAEC on the USS Saratoga (CV-60) in June 1970. The unit was subsequently removed in 1981.

Follow-on OPEVAL testing of a pre-production model CLASS Service Change Number 74 modification to the FLOLS MK-6 MOD 2 was successfully completed by the NATC and NAEC on the USS Kitty Hawk (CV-63) in March 1977.

Prototype OPEVAL testing verified that improved stabilization system performance was available with the CLASS modification to FLOLS. The pre-production version Service Change Number 74 testing on the USS Kitty Hawk (CV-63) qualified the design of the basic hardware, which has been procured for the entire operating fleet as the FLOLS MK-6 MOD 3.

Operation and maintenance crews on the evaluation ships with existing FLOLS MK-6 MOD 2 received a one-week course of instruction by NAEC and copies of preliminary manuals addressing the stabilization system. Crews were trained again on the FLOLS MK-6 MOD 3 upon incorporation of Service Change Number 74A in October 1986.

c. Improved Fresnel Lens Optical Landing System MK-13 MOD 0. OPEVAL for the IFLOLS was completed in March 1998 onboard the USS George Washington (CVN-73).

d. Integrated Launch and Recovery Television Surveillance System. Service Changes were incorporated into the major subsystems of ILARTS in the 1980s. Formal OPEVALs were not required for each Service Change to ILARTS components.

e. Landing Signal Officer Heads Up Display MK-1 MOD 0. Formal OPEVAL was not required for the LSO HUD.

f. Long Range Line-Up System. Formal OPEVAL was not required for LRLS.

g. Manually Operated Visual Landing Aid System MK-1 MOD 2. Formal OPEVAL was not required for the MOVLAS MK-1 MOD 2.

h. Virtual Imaging Systems For Approach and Landing. OPEVAL for VISUAL will be accomplished in FY02-03 during the EMD phase of the VISUAL program.

i. Wind Measuring Indicating System. Formal OPEVAL was not required for the WMIS.

F. AIRCRAFT AND/OR EQUIPMENT/SYSTEM/SUBSYSTEM REPLACED

1. Flight Deck Centerline Light Sequence Flasher System. The Flight Deck Centerline LSFS replaced the Runway Centerline Flashing Controller System (NAEC 507625-1) used on CVs.

2. Fresnel Lens Optical Landing System MK-6 MOD 3. The FLOLS MK-6 MOD 3 updated the FLOLS MK-6 MOD 2 with the installation of Service Change Number 74A.

3. Improved Fresnel Lens Optical Landing System MK-13 MOD 0. The IFLOLS will update and replace the FLOLS MK-6 MOD 3.

4. Integrated Launch and Recovery Television Surveillance System. The ILARTS replaced the Pilot Landing Aid Television (PLAT) System.

5. Landing Signal Officer Heads Up Display MK-1 MOD 0. The LSO HUD replaced the AN/SPN-42 Radar Airspeed Panels and the PLAT centerline monitor in the Landing Signal Officer (LSO) instrument console.

6. Long Range Line-Up System. LRLS will not replace any system.

7. Manually Operated Visual Landing Aid System MK-1 MOD 2. MOVLAS did not replace any system.

8. Virtual Imaging Systems For Approach and Landing. The VISUAL system will replace obsolete stand-alone systems and components found in ILARTS and at the LSO Workstation.

9. Wind Measuring Indicating System. WMIS did not replace any system.

G. DESCRIPTION OF NEW DEVELOPMENT

1. Functional Description

a. Flight Deck Centerline Light Sequence Flasher System. The Flight Deck Centerline LSFS provides line-up information to enable the pilot of an approaching aircraft to visually establish the required direction of approach and identify the centerline of the landing area. This is accomplished by presenting a spot of light that appears to be moving forward along the runway centerline. There are seventeen lights spaced approximately forty-five feet apart. The

flash intensity, steady background intensity, and the period between the end of one flashing sequence and the beginning of the next are independently adjustable. The Flight Deck Centerline LSFS is capable of lighting all lamps simultaneously and controlling their intensity in the steady mode. The Flight Deck Centerline LSFS employs state-of-the-art electronics in a simplified, versatile design that is reliable and maintainable.

b. Fresnel Lens Optical Landing System MK-6 MOD 3. The FLOLS MK-6 MOD 3 is the primary aircraft optical landing aid used onboard CVs and CVNs. The system provides a vertical bar of light that appears in the source light indicators of the deck edge assembly. The position of this bar of light with respect to a set of fixed horizontal datum lights indicates to the approaching aircraft pilot his location with respect to being above, below, or on the correct glideslope. The FLOLS MK-6 MOD 3 system consists of the following sections:

(1) Power and Lighting Control Section. The Power and Lighting Control Section provides supplemental power for the system, light switching, fault monitoring, and dimming facilities to control the light displays on the deck edge assembly. It also provides a FLOLS wave-off light actuation interface with the Automatic Carrier Landing System (ACLS) AN/SPN-46(V).

(2) Stabilization Section. The Stabilization Section interfaces with the ship's gyro and electronically computes, controls, and monitors the appropriate inputs to the deck edge assembly. The servo drive provides pitch and roll stabilization of the source light display (meatball) in a line or inertial mode of operation. The servo drive also has redundant electronic circuits, including an internal gyro that make it capable of detecting an internal or ship's gyro fault. These circuits also compare signals and sound an alarm when too wide a difference in signal level occurs. When a fault does occur, the capability exists to switch out the failed gyro and continue operation until the fault can be isolated with Built-In Test Equipment (BITE).

(3) Deck Edge Section. The Deck Edge Section includes a gimbaled, servo-driven stabilized platform to mount the source light (stack of five Fresnel Lens cells). When the source light appears to the pilot to change position relative to a built-in row of horizontal datum lights on both sides of the source light, a relative change in glide slope is indicated. The deck edge assembly also mounts flashing red wave-off lights that are used to signal the need for an aborted approach (unsafe landing conditions), and green cut lights that are used to communicate between the LSO and approaching aircraft.

(4) Augmenting Equipment Section. The Augmenting Equipment Section consists of the FLOLS and arresting gear crosscheck system. This system is used to verify that operators have correctly identified the approaching aircraft. In operation, the FLOLS controller and arresting gear controller in Primary Flight (PRI-FLY) push a button with the understood next-aircraft-to-land aircraft type inscribed on it. If there is coincidence, that particular aircraft type will light up on the Air Bosses readout. This system interfaces with the LSO HUD console system to display the verified aircraft type on the LSO HUD console.

c. Improved Fresnel Lens Optical Landing System MK-13 MOD 0. Like FLOLS, IFLOLS will be the primary aircraft optical landing aid used onboard CVs and CVNs. The IFLOLS will provide the pilot with improved visual landing guidance through the display of more precise information at greater range than FLOLS. This will improve boarding rates and safety by reducing the probability of large corrections in close range of aircraft landings. IFLOLS provides stabilized optics with visual acquisition and information range from one nautical mile to touchdown. In addition to being stabilized for ship's pitch and roll, it also compensates for heave in nearly all sea states in which aircraft recoveries can be performed (up to and including sea state 5, i.e., 13 foot seas). Stabilization, light intensity, aircraft settings, and signaling will be controlled by the IFLOLS control system. The unit will have indenture Built-In Test and fault isolation capability. It meets Electro-Magnetic Interference, Radio Frequency Interference, and Electro-Magnetic Pulse susceptibility requirements, is Class A shock-hardened, and meets full environmental requirements for sustained operations at sea.

d. Integrated Launch and Recovery Television Surveillance System. ILARTS provides an immediate and recordable closed circuit television display of CV and CVN launch and recovery operations. The televised information is displayed in real-time to facilitate control of flight operations. The video recording of this information assists in the analysis of those operations. The four major equipment groups are the Camera Chains, Equipment Racks, Remote Television Monitoring Equipment, and the Control Console.

(1) Camera Chains. Two fixed lens Intensified Silicon Intensified Target (ISIT) cameras are mounted below the landing area centerline. One ISIT camera that is panned and tilted manually is located on the inboard side of the island structure. Three remote controlled (pan and tilt) cameras are installed at the outboard edge of the flight deck area for observing aircraft catapult hook-ups, tensioning, and launching operations.

(2) Equipment Racks. Located within the ILARTS System Control Room are two equipment racks, labeled Equipment Rack #1 and Equipment Rack #2. Equipment Rack #1 houses nine system components. These components are a nine-inch Television (preview) Monitor, a Waveform Monitor, a Preview Select (push-button) Panel Assembly, Sync Generator Number 1, Sync Generator Number 2, an Automatic Changeover Switch, a Data Generator, an Electronic Crosshair Stabilization System (ECSS) Unit, and a Blower Assembly. Equipment Rack #2 houses ten system components. These components are the Lens Power Supply, three Pan and Tilt Controller Assemblies, four Video Cassette Recorder (VCRs), the Video and Pulse Distribution Rack Assembly, and a Blower Assembly.

(3) Remote Television Monitoring Equipment. Television monitors are located in various spaces throughout a ship. Typical locations at which televised video is displayed include the LSO HUD, the Flag Bridge, the Navigation Bridge, the Combat Information Center (CIC), the Squadron Ready Rooms, the Flight-Deck and Aviation Maintenance Control Centers, and PRI-FLY Control. This equipment provides a method for Naval aviator flight operational debriefing and training and accident or incident analysis. It can also be used for the debriefing of flight deck handling personnel training evolutions. There are three different sizes of remote monitors, 9-inch, 14-inch, and 17-inch (dependent on availability).

(4) Control Console. The ILARTS Control Console is a three-unit assembly located in the ILARTS Control Room. The console is designed to combine operational controls, control panels, and displays (monitors), into a rack-and-panel array that can be operated by a single person. The components within the Console Equipment Racks permit the console operator to monitor, record, and distribute TV camera video.

e. Landing Signal Officer Heads Up Display MK-1 MOD 0. The LSO HUD System is designed for use on the LSO platform of a CV or CVN to permit the LSO to view critical aircraft recovery data without taking his eyes significantly off an approaching aircraft. Its purpose is to provide the LSO with a consolidated display of important aircraft and recovery deck status and trend information. This enables identification of poor recovery conditions that can be corrected before they lead to a marginally safe recovery or wave-off. The system consists of two subsystems, the Display Subsystem and the Hydraulic Lift Subsystem. The Display Subsystem electrically interfaces with various other shipboard systems for input signals to drive the LSO HUD console displays. The Hydraulic Lift Subsystem provides a means for raising the console to a viewing height and lowering it into a weather enclosure for stowage.

f. Long Range Line-Up System. The LRLS consists of a deck edge unit and an operator station. The Deck Edge Unit provides stabilized visual cues. The unit provides a light source appearing to the pilot as a single point of light emanating from below the landing area threshold (ramp of the ship). The system is designed such that the pilot sees a yellow light when on the proper centerline approach. A slight misalignment to the right of centerline will be indicated by a steady green light. A further right misalignment will be indicated by a slow flashing green light. An extreme right misalignment will be indicated by a fast flashing green light. Likewise, a slight misalignment to the left of centerline will be indicated by a steady red light. A further left misalignment will be indicated by a slow flashing red light. An extreme left misalignment will be indicated by a fast flashing red light.

The Deck Edge Unit allows for movement in the pitch and roll axis to provide a stabilized light source in space for the approaching pilot. Stabilization input signals provide a level sensor internal to the stabilization platform assembly. These inputs are processed by a stabilization control subsystem, which supplies drive signals to the Deck Edge Unit.

The operator control station located in PRI-FLY is the primary point of control.

g. Manually Operated Visual Landing Aid System MK-1 MOD 2. The MOVLAS is an emergency signaling system intended to be used when the primary optical landing system is rendered inoperative. The system is designed to present glide slope information to the pilot of an approaching aircraft in the same manner as FLOLS or IFLOLS. As a substitute for the FLOLS or IFLOLS, the MOVLAS has three locations.

- MOVLAS Station #1- light box aft of FLOLS or IFLOLS at the deck edge on the deck edge platform
- MOVLAS Station #2 - light box and datum's 75-100 feet aft of the island

- **MOVLAS Station #3** - starboard side within 100 feet of the starboard control station. MOVLAS Station #3 is usually aft of the CV/CVN island; however, on USS Kennedy (CV-67) it is on the starboard side of Flight Deck Control near the forward part of the island.

h. Virtual Imaging Systems For Approach and Landing. VISUAL is an electro-optical sensor and display system that will provide the ship's company and approaching pilots enhanced images of the aircraft and ship, respectively, in low visibility and night conditions. VISUAL in its entirety is applicable to all CV and CVN class ships. It will integrate the following inter-related elements: Electro-Optical Tracking System, LSO Workstation, and Fixed Glidepath Sensor.

(1) Electro-Optical Tracking System. The Electro-Optical Tracking System will be a day, night infrared, TV, and laser and ranging tracking system to image and track aircraft during approach and landing.

(2) LSO Workstation. The LSO Workstation will be an integrated set of displays and controls that provide the LSO with aircraft and ship information necessary to aid in expediting the safe and efficient recovery and launch of aircraft.

(3) Fixed Glidepath Sensor. The Fixed Glidepath Sensor will be a fixed camera that will provide an easily interpretable view of the aircraft during recoveries and will provide the LSO with a reference for aircraft glideslope and line-up positions.

i. Wind Measuring Indicating System. All Navy and Coast Guard ships are equipped with a WMIS, which provides continuous visual indication of wind direction (in degrees) and wind speed (in knots) relative to the ship's bow. The system also provides electrical signals representative of wind direction and speed for computation of flight deck crosswind and head wind conditions, computation of wind vectors for weapon launch systems, and record keeping by meteorological equipment. There are two primary types of WMIS in use, Type B and Type F. Both systems operate by transmission of electrical synchro signals. The Type B system is based on 60 Hz electrical power, while the newer Type F system utilizes 400 Hz. Type B systems will eventually be replaced by Type F systems. Type F systems have replaced the B systems on CVs and CVNs. Type B systems remain on a significant number of air capable and amphibious ships.

2. Physical Description

a. Flight Deck Centerline Light Sequence Flasher System

NOMENCLATURE	HEIGHT (inches)	WIDTH (inches)	DEPTH (inches)	WEIGHT (pounds)	LOCATION
Control Panel Assembly	11.5	9.25	5.75	7	PRI-FLY
Night Flight Lighting Control Panel	11.5	9.25	5.75	7	PRI-FLY
Local or Remote Transfer Panel Assembly	11.5	9.25	5.75	7	Flight Deck Lighting Equip. Room
Control Unit Assembly	38.5	30.00	13.25	371	Flight Deck Lighting Equip. Room
Power Distribution Unit Assembly	32.5	30.00	13.5	245	Flight Deck Lighting Equip. Room

b. Fresnel Lens Optical Landing System MK-6 MOD 3

FLOLS MK 6 MOD 3 Components Physical Characteristics

NOMENCLATURE	HEIGHT (inches)	WIDTH (inches)	DEPTH (inches)	WEIGHT (pounds)	LOCATION
I. Power and Lighting Control Section:					
(a) Power Panel Assembly	72	19	30	435	FLOLS Equipment Room
(b) Source Light Failure Indicator Assembly	10.625	7.625	5	11	FLOLS Equipment Room
(c) Emergency Wave Off Box	10.625	7.625	5	10	LSO Platform
(d) AN/SPN-46 Wave Off Interface Box	12.75	9.5	4.5	15	LSO Equipment Room

NOMENCLATURE	HEIGHT (inches)	WIDTH (inches)	DEPTH (inches)	WEIGHT (pounds)	LOCATION
(e) PRI-FLY Lighting Remote Control Panel	26	16	19.5	75	PRI-FLY
(f) Lens Room Lighting Remote Control Panel	30.125	16	19.5	85	FLOLS Equipment Room
(g) LSO Platform Lighting Remote Control Panel	20.375	15.375	6	45	LSO Base Console
(h) Wave-Off Monitor	8	5.25 dia.	6	3	Lens Boom and LSO Station
(i) Disconnect and Monitor Assembly	17.5	23.25	9	30	FLOLS Equipment Room
(j) Emergency Wave-Off Control Box Assembly	18	16	7	65	FLOLS Equipment Room
(k) Power Supply Assembly	8	7	15	20	FLOLS Equipment Room
II. Stabilization Section:					
(a) Stabilization Control Console	71	24	30	600	FLOLS Equipment Room
(b) PRI-FLY Stabilization Remote Panel	17.75	28	10.5	60	PRI-FLY
(c) Lens Room Stabilization Remote Panel	17.75	28	10.5	60	FLOLS Equipment Room
(d) LSO Platform Stabilization Remote Panel	18.33	26	19.5	33	LSO Base Console
(e) Gyro Sensing Unit	11	10	14	65	FLOLS Equipment Room

NOMENCLATURE	HEIGHT (inches)	WIDTH (inches)	DEPTH (inches)	WEIGHT (pounds)	LOCATION
(f) Gyro Cover Assembly	12	11	15	20	FLOLS Equipment Room
III. Deck Edge Section:					
Deck Edge Assembly	54	248.38	47.5	1800	Lens Boom
IV. Augmenting Equipment Section:					
(a) FLOLS and Arresting Gear Crosscheck System:				75*	PRI-FLY
(1) DC Power Supply	9	13	6	*	PRI-FLY
(2) Arresting Gear Operator Push Button Station	9	13	6	*	PRI-FLY
(3) FLOLS Operator Push Button Station	8	12	4	*	PRI-FLY
(4) Air Officer Indicator Station	9	13	6	*	PRI-FLY
(5) LSO HUD System Interface Junction Box	16	12	6	*	PRI-FLY

* **Note:** Items IV.a.1 through IV.a.5 individual weights are not available. See section IV (a) for total weight of IV.a.1 through IV.a.5.

c. Improved Fresnel Lens Optical Landing System MK-13 MOD 0. The following table displays the equipment that will be installed onboard ship to replace FLOLS.

IFLOLS Equipment That Replaces FLOLS

NOMENCLATURE	HEIGHT (inches)	WIDTH (inches)	DEPTH (inches)	WEIGHT (pounds)	LOCATION
Indicator Display Assembly	73	17	42	1350	Lens Boom
Lens Room Electronics Enclosure Assembly	53	30	58	400	FLOLS Equipment Room

NOMENCLATURE	HEIGHT (inches)	WIDTH (inches)	DEPTH (inches)	WEIGHT (pounds)	LOCATION
PRI-FLY Control Panel Assembly	21.9	24.7	13.9	120	PRI-FLY
LSO Control Panel Assembly	18.5	13	24.5	70	LSO Base Console
Heave Sensor Assembly	12	5.6	12.75	20	FLOLS Equipment Room
Stabilized Optics Table	2.7	10	16.3	8	Lens Boom
Mounting Structure Assembly	65	51	51.8	800	Lens Boom
Port Datum Arm Assembly	50	27	70	100	Lens Boom
STBD Datum Arm Assembly	50	27	70	100	Lens Boom
Distribution Junction Box	17.5	6.2	15	20	LSO Equipment Room
Port Wave Off and Cut Lamp Arm Assembly	57	33	40	120	Lens Boom
STBD Wave Off and Cut Lamp Arm Assembly	57	33	40	120	Lens Boom
Emergency Wave-off Control Panel Assembly	17	16	6.25	60	FLOLS Equipment Room
Lighting Junction Box Assembly	7.6	11.4	13.4	16.9	Lens Boom
XFMR Enclosure Assembly	24	8	24	175	Lens Boom
Wave-off Indicator Monitor	8	5.25 dia.	NA	3	Lens Boom

d. Integrated Launch and Recovery Television Surveillance System. The six major equipment groups are the Camera Chains, Equipment Racks, VCR, Reproducers and Rack, Remote Television Monitoring Equipment, and the Control Console.

ILARTS Components Physical Characteristics

NOMENCLATURE	HEIGHT (inches)	WIDTH (inches)	DEPTH (inches)	WEIGHT (pounds)	LOCATION
Control Console Equipment Rack 4A3 Assembly	67	23	26	463	ILARTS Control Room
Control Console Equipment Rack 4A2 Assembly	67	23	26	520	ILARTS Control Room
Control Console Equipment Rack 4A1 Assembly	67	23	26	682	ILARTS Control Room
Equipment Rack No. 2 Assembly	67	23	26	480	ILARTS Control Room
Equipment Rack No. 1 Assembly	67	23	26	480	ILARTS Control Room
Data Junction Box	24	20	67	30	ILARTS Control Room
Camera Junction Box Quantity 3	20	67	32	35	ILARTS Control Room
Catapult Surveillance Junction Box	24	20	658	30	ILARTS Control Room

e. Landing Signal Officer Heads Up Display MK-1 MOD 0. The LSO HUD consists of two subsystems; the Display Subsystem and the Hydraulic Lift Subsystem. The Display Subsystem electrically interfaces with various other shipboard systems for input signals to drive the LSO HUD console displays. The Hydraulic Lift Subsystem provides a means for raising the console to a viewing height and lowering it into a weather enclosure for stowage.

LSO HUD Physical Characteristics

NOMENCLATURE	HEIGHT (inches)	WIDTH (inches)	DEPTH (inches)	WEIGHT (pounds)	LOCATION
HUD Console Assembly	24.5	25.4	24.0	150	LSO Platform
Auxiliary Electronics Enclosure Assembly	32.5	24.0	9.3	145	LSO Equipment Room
Pedestal Assembly	107.0	14.5	17.7	675	LSO Platform
Hydraulic Power Package	54.0	51.0	37.4	1650	LSO Equipment Room
Hydraulic Lift Control Panel Assembly	14.3	14.6	8.3	30	LSO Platform
Central Junction Box Assembly	26.5	24.7	10.0	60	LSO Equipment Room
440V Transformer	10.2	7.5	7.1	23.5	LSO Equipment Room
Limited Switches Junction Box	13.8	11.5	5.3	20	LSO Platform
Pendent Switch Assembly	15.9	3.0	3.0	4	LSO Platform
HUD Console Storage Enclosure	29.1	49.6	41.4	383	LSO Platform
Signal Junction Box	26.6	24.0	8.9	4.0	LSO Equipment Room
Synchro Junction Box Assembly	25.5	20.0	6.9	50	LSO Equipment Room
MOVLAS Electronics Interface Box	23.0	16.0	8.2	30	LSO Equipment Room
Test Simulator Interface Box	15.8	16.8	10.3	8	LSO Platform
Test Simulator	12.5	17.0	10.0	25	LSO Platform

f. Long Range Line-Up System. The LRLS consists of a deck edge unit and a control panel. The deck edge unit provides a light source to the pilot from below the landing area threshold (stern of the ship).

LRLS Physical Characteristics

NOMENCLATURE	HEIGHT (inches)	WIDTH (inches)	DEPTH (inches)	WEIGHT (pounds)	LOCATION
Optical Head	5.0	42.0	42.0	140	Fantail
Stabilization Platform	26.9	48.9	44.6	400	Fantail
Weather Cover	6.5	48.5	65.0	60	Fantail
Control Panel Assembly	6.5	10.5	3.0	10	PRI-FLY

g. Manually Operated Visual Landing Aid System MK-1 MOD 2. The following table lists MOVLAS major components' characteristics:

MOVLAS Physical Characteristics

NOMENCLATURE	HEIGHT (inches)	WIDTH (inches)	DEPTH (inches)	WEIGHT (pounds)	LOCATION
Light Box (A-100A)	60.5	12	5.5	46	Lens Control Room
LSO Controller (A-200)	61	6.3	16.8	25	LSO Platform
* Power Control Box (A-300A)	23	16	8	96	Lens Control Room
Datum Light Boxes (A-400A), (A-401A)	25.5	66	4.75	17.5	LSO Platform
* Datum Control Box (A-500A)	23	16	8	75	LSO Platform
Transformer (A-600A)	23	16	8	105	LSO Platform
Dual Connector Box (A-1000)	23	16	8	42	LSO Platform
Light Box Monitor (A-1100)	11	7	7.3	20	LSO Platform
Junction Box (A-1200)	16	12	7.2	40	PRI-FLY

* **Note:** Power required to operate the Power Control Box is 115 Volts, 60 Cycle (Type1), Single Phase, 20 Amperes (MAX). Power Required to operate the Datum Control Box is 115 Volts, 60 Cycle (Type 1), Single Phase, 25 Amperes (MAX).

h. Virtual Imaging Systems For Approach and Landing. VISUAL is in the early stages of development. Physical characteristics and shipboard location information are not available at this time but will be incorporated into future NTSP updates.

i. Wind Measuring Indicating System. The major units making up WMIS include a detector unit, transmitter unit, and an indicator unit. On larger ships the system may include a crosswind, head-wind computer unit and crosswind, head-wind speed indicator unit, and a wind velocity recorder unit. Most carriers are also equipped with BITE (which is planned for major combat ships as well).

WMIS Physical Characteristics

NOMENCLATURE	HEIGHT (inches)	WIDTH (inches)	DEPTH (inches)	WEIGHT (pounds)	LOCATION
Detector Unit	32.5	15.5	27.5	15.5	Top of Island
Transmitter Unit	13.5	15.5	7.5	61.0	IC SWRM
Indicator Unit	11.12	7.38	4.81	15.0	Various
Single Station BITE	24.0	20.0	11.16	81.0	Metro
Dual Station BITE	14.0	13.0	7.0	24.0	Metro

Note: Metro is the abbreviation for Meteorological.

3. New Development Introduction

a. Flight Deck Centerline Light Sequence Flasher System. The Flight Deck Centerline LSFS was introduced to the fleet under the Fleet Modernization Program, the Service Life Extension Program, and new ship construction program.

b. Fresnel Lens Optical Landing System MK-6 MOD 3. The FLOLS MK-6 MOD 3 was incorporated as a modification to the previously installed system on CVs and CVNs.

c. Improved Fresnel Lens Optical Landing System MK-13 MOD 0. The IFLOLS is being incorporated as a replacement for the currently installed FLOLS MK-6 MOD 3 on CVs and CVNs.

d. Integrated Launch and Recovery Television Surveillance System. The ILARTS was introduced as a series of Service Changes between 1980 and 1989.

e. Landing Signal Officer Heads Up Display MK-1 MOD 0. The LSO HUD was introduced to the fleet under the Fleet Modernization Program, the Service Life Extension Program, and new ship construction programs.

f. Long Range Line-Up System. The LRLS will be introduced to the fleet under the Fleet Modernization Program, Service Life Extension Program, and new ship construction program.

g. Manually Operated Visual Landing Aid System MK-1 MOD 2. The MOVLAS was introduced to the fleet under the Fleet Modernization Program, the Service Life Extension Program, and new ship construction program.

h. Virtual Imaging Systems For Approach and Landing. VISUAL will be introduced to the fleet under the Fleet Modernization Program, Service Life Extension Program, and new ship construction program.

i. Wind Measuring Indicating System. The WMIS was introduced to the fleet under the Fleet Modernization Program, the Service Life Extension Program, and new ship construction program.

4. Significant Interfaces

a. Flight Deck Centerline Light Sequence Flasher System. The Flight Deck Centerline LSFS interfaces with the flight deck centerline lights.

b. Fresnel Lens Optical Landing System MK-6 MOD 3. The FLOLS MK-6 MOD 3 interfaces with the following ships systems:

- Ship's Gyro
- ILARTS
- LSO HUD Console
- Air Officer's Lighting Interlock
- Emergency Wave Off
- Air Officer's Wave Off Switch
- ECSS

c. Improved Fresnel Lens Optical Landing System. The IFLOLS interfaces with the following ships systems:

- AN/SPN-46 Gyro
- ILARTS
- LSO HUD Console
- Ship's Inertial Navigation System (SINS)
- Air Officer's Lighting Interlock
- Emergency Wave Off
- Air Officer's Wave Off Switch
- AN/SPN-46 ACLS

d. Integrated Launch and Recovery Television Surveillance System. Systems that interface with ILARTS include:

- Landing Area Status System
- FLOLS or IFLOLS
- AN/SPN-46 Radar ACLS
- WMIS
- MOVLAS

e. Landing Signal Officer Heads Up Display MK-1 MOD 0. LSO HUD interfaces with the following systems:

- AN/SPN-46 Radar ACLS
- ILARTS
- IFLOLS or FLOLS
- Landing Area Status System
- WMIS
- MOVLAS

f. Long Range Line-Up System. LRLS does not interface with other systems.

g. Manually Operated Visual Landing Aid System MK-1 MOD 2. MOVLAS interfaces with the following systems:

- ILARTS
- LSO HUD Console

h. Virtual Imaging Systems For Approach and Landing. VISUAL will interface with the following systems:

- AN/SPN-46 Radar ACLS
- IFLOLS or FLOLS
- Landing Area Status System
- WMIS
- MOVLAS

i. Wind Measuring Indicating System. WMIS interfaces with the following systems:

- ILARTS
- LSO HUD
- AN/SPN-46 Radar ACLS
- AEGIS
- AN/SLQ-32
- ACDS BLOCK 0

- ACDS BLOCK 1
- AN/SLY2 AIEWS
- ICAN
- NAVSSI
- ADMACS
- VISUAL
- SSDS MK2
- AN/TPX-42

5. New Features, Configurations, or Material

a. Flight Deck Centerline Light Sequence Flasher System. Flight Deck Centerline LSFS employs state-of-the-art electronics in a more simplified, versatile design which is more reliable and maintainable than the older Runway Centerline Flashing Controller System.

b. Fresnel Lens Optical Landing System MK-6 MOD 3. The incorporation of Service Change 74A improved maintenance support posture and operating availability by replacing the ship's peculiar design of the FLOLS MK-6 MOD 2 mechanical computer, which could only be repaired or aligned at the depot. The new electronic computer can be repaired in place by the FLOLS technician at the organizational level.

c. Improved Fresnel Lens Optical Landing System MK-13 MOD 0. IFLOLS will increase glideslope information from 0.75 nautical mile or less to 1.0 nautical mile, increase the capability to remain more stabilized in all sea states, and less reliance on the MOVLAS. This will increase safe aircraft boarding rates and be less labor intensive than FLOLS.

d. Integrated Launch and Recovery Television Surveillance System. New solid-state VCRs, monitors, and cameras can now be controlled remotely by the ILARTS control console.

e. Landing Signal Officer Heads Up Display MK-1 MOD 0. NA

f. Long Range Line-Up System. LRLS provides an overall improvement in precision visual landing cues to pilots at greater ranges than existing lineup displays.

g. Manually Operated Visual Landing Aid System MK-1 MOD 2. NA

h. Virtual Imaging Systems For Approach and Landing. VISUAL is in the early development stages. New features, configurations, or material information have not been determined. This information will be incorporated into future NTSP updates.

i. Wind Measuring Indicating System. NA

H. CONCEPTS

1. Operational Concept

a. Flight Deck Centerline Light Sequence Flasher System. Personnel assigned to the PRI-FLY Control Station operate the Flight Deck Centerline LSFS. The equipment controls the lighting, which provides visual cues for accomplishing safe aircraft recovery under various mission requirements and visibility conditions. This is accomplished by providing the pilot of an approaching aircraft with enhanced centerline definition and depth perception cues. Normal flight operations are in the range of sixteen hours daily with surge ability to provide twenty-four hours daily continuous operations. Normal operations of the Flight Deck Centerline LSFS are throughout flight operations (16 hours).

b. Fresnel Lens Optical Landing System MK-6 MOD 3. The operation of the FLOLS is performed by Interior Communications Electricians (ICs), Navy Enlisted Classification (NEC) 4745, located within the lens room as part of the watchstation requirement. The IC can make lens stabilization settings in the FLOLS room, or in PRI-FLY. The IC can make lens intensity control and wave-off and cut light activation in either the FLOLS room, or PRI-FLY, or the LSO at the LSO platform. FLOLS is the primary VLA supporting day and night aircraft recoveries aboard CVs and CVNs. The VLA must be operating as long as there is the potential for aircraft recovery. It is preoperational checked daily and conceivably could be required to operate continuously for days at a time. The expected maximum utilization rate of the VLA equipment is six thousand hours per year.

c. Improved Fresnel Lens Optical Landing System MK-13 MOD 0. Like FLOLS, the operation of the IFLOLS is performed by ICs, NEC 4745, located within the lens room as part of the watchstation requirement. The IC can make lens stabilization settings in the IFLOLS room, or in PRI-FLY. The IC in the IFLOLS room, or in PRI-FLY, or the LSO at the LSO platform can make lens intensity control and wave-off and cut light activation. IFLOLS is the primary VLA supporting day and night aircraft recoveries aboard CVs and CVNs. The VLA must be operating as long as there is the potential for aircraft recovery. It is preoperational checked daily and conceivably could be required to operate continuously for days at a time. The expected maximum utilization rate of the VLA equipment is six thousand hours per year.

d. Integrated Launch and Recovery Television Surveillance System. One hour prior to the beginning of launch or recovery operations, all positions are manned. Normal flight operations are in the range of sixteen hours daily, with one hour prior to and one hour after flight operations dedicated to preoperational and post-operational maintenance, with surge ability to provide twenty-four hours daily continuous operations. The ILARTS Control Console is turned on and checked by the Control Console operator. The system remains in operation and is continually monitored by the Control Console operator during all launch and recovery operations. Maximum anticipated use per year is 2000 hours.

e. Landing Signal Officer Heads Up Display MK-1 MOD 0. The LSO HUD operates during all aircraft recoveries aboard CVs and CVNs. Normal flight operations are in the

range of sixteen hours daily, with one hour prior to and one hour after flight operations dedicated to preoperational and post-operational maintenance, with surge ability to provide twenty-four hours daily continuous operations. Naval aviators trained as LSOs operate the LSO HUD.

f. Long Range Line-Up System. The operation of the LRLS is performed by ICs, NEC 4745, located within PRI-FLY as part of the existing watchstation requirement. The IC can make LRLS intensity control and Wave-Off and Cut Light activation in the IFLOLS room, the Air Officer in PRI-FLY, or the LSO at the LSO platform. LRLS will be a supporting VLA for primarily night-time aircraft recoveries aboard CVs and CVNs, however the LRLS will be operating as long as there is the potential for aircraft recovery.

Aircraft Launch and Recovery Equipment (ALRE) operates cyclically in support of air operations twenty-four hours per day seven days a week. The equipment is operated on a variable deck cycle ranging from less than one and up to three hours between launches while the ship is deployed. Normal flight operations are in the range of sixteen hours daily, with two hours prior to and two hours after flight operations dedicated to preoperational and post-operational maintenance, with surge ability to provide twenty-four hours daily continuous operations. Normal operations of the LRLS will be throughout flight operations (16 hours).

g. Manually Operated Visual Landing Aid System MK-1 MOD 2. ICs from V-2 division are responsible for emergency setup and breakdown of the MOVLAS after use. ICs are on call during all flight recovery operations.

h. Virtual Imaging Systems For Approach and Landing. The primary rates for operation and maintenance of this equipment have not yet been determined. Once this information becomes available, it will be incorporated into future NTSP updates.

i. Wind Measuring Indicating System. WMIS is activated during all underway periods, 24 hours per day.

2. Maintenance Concept. The maintenance concept for all VLA Systems contained in this NTSP follows the general direction and guidance outlined in the Naval Ships Maintenance, Material, and Management Program Manual, OPNAVINST 4790.4C.

a. Flight Deck Centerline Light Sequence Flasher System. The Flight Deck Centerline LSFS maintenance concept is based on organizational level maintenance as outlined in Maintenance Plan SSIED MP No. 001-87, prepared by Naval Air Warfare Center Aircraft Division, Lakehurst (NAWCADLKE), dated 26 October 1987.

(1) Organizational. Organizational level maintenance for the Flight Deck Centerline LSFS consists of a daily preoperational check, fault isolation to a defective component, and repair or replacement of the defective component.

(a) Preventive. Preventive maintenance is conducted at specified intervals per procedures established by Maintenance Requirement Cards (MRCs). Preventive maintenance actions include corrosion inspection, cleaning, and operational inspection.

(b) Corrective. Corrective maintenance is performed on repairable components as indicated by the Source, Maintenance, and Recoverability (SM&R) codes. Fault isolation is accomplished through the use of Built-In Test, common test equipment, and component replacement. Organizational level maintenance is performed by personnel in the Electrician's Mate (EM) rating assigned to the V-2 Division or the Engineering Department.

(2) Intermediate. No intermediate level maintenance is required for the Flight Deck Centerline LSFS.

(3) Depot. No depot level maintenance is required for the Flight Deck Centerline LSFS.

(4) Interim Maintenance. The Carrier and Field Service Unit (CAFSU) under NAWCADLKE direction provided technical support. Navy Support Date (NSD) for Flight Deck Centerline LSFS was October 1993.

(5) Life-cycle Maintenance Plan. NA

b. Fresnel Lens Optical Landing System (FLOLS) MK-6 MOD 3. The maintenance concept for the FLOLS follows the general direction and guidance outlined in OPNAVINST 4790.4C. It is conducted under the three-level concept (organizational, intermediate, and depot) as follows:

(1) Organizational. ICs in V2 Division perform preventive and corrective maintenance on the FLOLS.

(a) Preventive. Preventive maintenance is conducted at specified intervals per procedures established in the MRCs. These actions include corrosion inspections, cleaning, lubrication, alignment, adjustment, preoperational inspections, post-operational inspections, functional tests, and system checks.

(b) Corrective. Corrective maintenance consists of fault isolation of failed modules and components in place through the use of BITE, replacement of failed modules and components, functional test, and system calibration.

(2) Intermediate. Limited intermediate level maintenance is performed in the Aircraft Intermediate Maintenance Department (AIMD), Work Center 670, by Aviation Electronics Technician (ATs) with NEC 6673 and is restricted to the periodic calibration of digital multimeters used in the system.

(3) Depot. Corrective maintenance consists of repair or complete restoration, manufacture of parts assemblies, and functional testing of subassemblies SM&R coded for depot level repair. Naval Aviation Depot (NADEP) North Island provides depot level maintenance. Commercial services are required for overhaul and repair of the gyro and gyro erection amplifier. Scheduled overhaul for the FLOLS cell assemblies is 18 months for CVs and CVNs.

(4) Interim Maintenance. Technical support was provided by NAWC AD through their fleet technical services and logistics division field representatives located in North Island, Bremerton, Mayport, Portsmouth, Norfolk, and Yokosuka. NSD for FLOLS MK-6 MOD 3 was May 1988.

(5) Life-cycle Maintenance Plan. NA

c. Improved Fresnel Lens Optical Landing System MK-13 MOD 0. A remove-replace-repair maintenance concept is applied to the IFLOLS. Fault isolation is accomplished through the use of BITE and common test equipment. The maintenance concept for the IFLOLS follows the general direction and guidance outlined in OPNAVINST 4790.4C. It is conducted under the two-level concept (organizational and depot) as follows:

(1) Organizational. Shipboard corrective maintenance generally consists of fault isolating and replacing failed WRAs (including circuit boards, standard electronic modules, and subassemblies of major system components). ICs in V2 Division perform preventive and corrective maintenance on the IFLOLS.

(a) Preventive. Preventive maintenance is conducted at specified intervals per procedures established in the MRCs. These actions include corrosion inspections, cleaning, lubrication, alignment, adjustment, preoperational inspections, post-operational inspections, and functional tests.

(b) Corrective. Corrective maintenance consists of fault isolation of failed modules and components in place through the use of BITE, replacement of failed modules and components, functional test, and system calibration.

(2) Intermediate. There is no intermediate level maintenance.

(3) Depot. The ship's force is responsible for the overall maintenance and readiness of the IFLOLS, while the depot maintenance level is responsible for rework and overhaul of the IFLOLS WRAs. Corrective maintenance consists of repair or complete restoration, manufacture of parts assemblies, and functional testing of subassemblies SM&R coded for depot level repair. NADEP North Island provides depot level maintenance.

(4) Interim Maintenance. Voyage Repair Teams and Carrier Field Services under NAWC AD direction provide technical support. NSD for IFLOLS is scheduled for June 2002.

(5) Life-cycle Maintenance Plan. NA

d. Integrated Launch and Recovery Television Surveillance System. The maintenance concept for the ILARTS follows the general direction and guidance outlined in OPNAVINST 4790.4C. It is conducted under the three-level concept (organizational, intermediate, and depot levels). ILARTS components have been designed to facilitate rapid fault isolation and verification. All equipment, except the VCR, provides easy access to internal parts

to facilitate testing, module and component replacement, etc. Provisions also exist to quantitatively judge overall video quality at any point in the system and to compensate for certain deficiencies by adjustment at the control console. Although the organizational and intermediate level personnel may conceivably be the same, the degree of maintenance for each level is different, and therefore is delineated separately.

(1) Organizational. ICs holding NEC 4743 will perform preventive and corrective maintenance on ILARTS.

(a) Preventive. Preventive maintenance is conducted at specified intervals per procedures established in the MRCs. These actions include corrosion inspections, cleaning, lubrication, alignment, adjustment, preoperational inspections, and post-operational inspections.

(b) Corrective. Corrective maintenance consists of functional testing, assembly fault isolation, subassembly replacement and check-out, subassembly fault isolation, module replacement, repair of all electronic and electro-mechanical modules by part replacement (except for designated consumable components and items listed as depot repairable), calibration against secondary standards, and specified preventive maintenance.

(2) Intermediate. AIMD personnel in Work Center 670 onboard CVs and CVNs perform limited intermediate level maintenance consisting of calibration of test equipment.

(3) Depot. Depot level maintenance consists of major overhaul, repair, and disposition of all circuit boards and other subassemblies, rework of all severely damaged or corroded equipment, and the repair and calibration of all equipment beyond intermediate level capabilities, such as optical components, camera sensor assembly, integral gear trains, etc.

(4) Interim Maintenance. Voyage Repair Teams and CAFSU provided technical support under NAWCADLKE direction. ILARTS program implementation was through a series of subsystem service changes to the PLAT System. NSD for ILARTS was June 1987.

(5) Life-cycle Maintenance Plan. NA

e. Landing Signal Officer Heads Up Display MK-1 MOD 0. The maintenance concept for the LSO HUD follows the general direction and guidance outlined in OPNAVINST 4790.4C. It is conducted under the three-level concept (organizational, intermediate, and depot). A remove-replace-repair maintenance concept is applied to the LSO HUD System. Shipboard corrective maintenance generally consists of isolating and replacing failed circuit boards and other subassemblies. Fault isolation in the display subsystem is accomplished through use of the test simulator, a multimeter, and the occasional use of a portable oscilloscope.

(1) Organizational. Organizational level maintenance consists of fault isolation, component assembly or subassembly replacement, system calibration and check-out, and specified preventive maintenance. Maintenance is performed by ICs holding NEC 4745 and

possible assistance from Aviation Boatswain's Mate Launching and Recovery Equipment (ABEs) holding NEC 7006.

(a) Preventive. Preventive maintenance is conducted at specified intervals per procedures established in the MRCs. Preventive maintenance includes visual inspections, cleaning of HUD optical surfaces and air screens, the removal and replacement of hydraulic filters, hydraulic fluid sampling, and lubrication of key areas of the HUD.

(b) Corrective. Corrective maintenance is performed on repairable items as indicated by the SM&R codes. Fault isolation to subassemblies and piece parts is accomplished through the use of a test simulator, digital multimeter, oscilloscope, and visual inspection. Repairs consist of removal and replacement of subassemblies, piece parts, and system calibration.

(2) Intermediate. Intermediate level maintenance is limited to fault isolation, repair, and functionally testing a faulty LSO HUD console by using the existing shipboard shop facilities.

(3) Depot. Depot level personnel screen all repairable items received from intermediate level. Repair is accomplished on all items where repair is considered cost effective. Depot level maintenance consists of fault isolation, repair, and replacement of failed circuit board components. Depot level refurbishes system components and assemblies on an as needed basis. Depot repair is accomplished by NADEP, North Island.

(4) Life-cycle Maintenance Plan. Technical support is provided by the CAFSU under NAWC AD direction. NSD was established in January 1989.

f. Long Range Line-Up System. LRLS maintenance follows the general direction and guidance outlined in OPNAVINST 4790.4C. It is conducted under two levels of maintenance, organizational and depot.

(1) Organizational. ICs with NEC 4745 in the V-2 division perform maintenance on the LRLS.

(a) Preventive. Preventive maintenance is conducted at specified intervals per procedures to be established by MRCs. Preventive maintenance actions consist primarily of optical lens cleaning and inspection for corrosion and integrity of connector weather-proofing.

(b) Corrective. Corrective maintenance consists of fault isolation of failed modules and components in place, replacement of failed modules and components, and connector weather-proofing.

(2) Intermediate. No maintenance is required at this level.

(3) Depot. Depot level maintenance consists of repair, complete restoration, and manufacture of parts, assemblies, subassemblies, and end items. The contractor provides depot level maintenance.

(4) Interim Maintenance. LRLS is a commercial Non-Developmental Item (NDI) system. The contractor provides interim maintenance. NSD is scheduled for May 2000.

(5) Life-cycle Maintenance Plan. NA

g. Manually Operated Visual Landing Aid System MK-1 MOD 2. The maintenance concept for the MOVLAS follows the general direction and guidance outlined in OPNAVINST 4790.4C. It is conducted under a one-level concept, organizational level.

(1) Organizational. Organizational level maintenance for the MOVLAS consists of fault isolation, component assembly removal, repair, or replacement, and specified preventive maintenance. Maintenance is performed by ICs holding NEC 4745.

(a) Preventive. Preventive maintenance is conducted at specified intervals per procedures to be established by MRCs. Preventive maintenance actions include cleaning, inspection, alignment and adjusting, and operational and functional testing of units making up the MOVLAS.

(b) Corrective. Corrective maintenance includes functional testing, fault isolation to the failed component, removal, repair or replacement.

(2) Intermediate. No intermediate level maintenance is required for MOVLAS.

(3) Depot. No depot level maintenance is required for MOVLAS.

(4) Interim Maintenance. Technical support was provided by the CAFSU under NAWCADLKE direction. NSD was September 1969.

(5) Life-cycle Maintenance Plan. NA

h. Virtual Imaging Systems For Approach and Landing. TBD

i. Wind Measuring Indicating System. The WMIS maintenance concept is based on three levels of maintenance (organizational, intermediate, and depot) as outlined in Maintenance Plan SSIED MP No. 002-80, prepared by NAWCADLKE, dated 25 November 1980.

(1) Organizational. Organizational level maintenance includes all maintenance performed aboard ship by ship's personnel. Organizational level maintenance of the WMIS is performed by ICs on all classes of ships.

(a) Preventive. Preventive maintenance is conducted at specified intervals per procedures to be established by MRCs. Preventive maintenance actions include cleaning, inspection, lubrication, and operational and functional testing.

(b) Corrective. Corrective maintenance consists of operational and functional tests, fault isolation and unit repair. Repair and replacement is limited; refer to technical manuals for further breakdown.

(2) Intermediate. Intermediate level maintenance is performed at Shore-based Intermediate Maintenance Activities (SIMAs) and afloat aboard tenders. Authorized maintenance is performed by ICs. Corrective maintenance at the intermediate level is accomplished to the component or piece-part level by removal, repair, and replacement. Corrective maintenance consists of repair and operational test of the detector and the transmitter assembly, electrical zeroing, and functional test of the indicator. For repair and replacement limitations refer to the technical manuals.

(3) Depot. Depot level maintenance includes Class B repair or overhaul and calibration of all end items, including units, repairable assemblies, subassemblies, and components coded for depot repair or found to be beyond the capability of intermediate maintenance activities.

(4) Interim Maintenance. Technical support was provided by the CAFSU under NAWC AD direction. Type F Hi-Shock WMIS System NSD was February 1997.

(5) Life-cycle Maintenance Plan. NA

3. Manning Concept

a. Flight Deck Centerline Light Sequence Flasher System. Organizational level manpower requirements did not change due to the installation of the Flight Deck Centerline LSFS. Manpower requirements were determined through workload comparability analysis per Military Manpower/Hardware Integration (HARDMAN) methodology procedures and information from Subject Matter Experts (SMEs) at CAFSU Norfolk, CAFSU San Diego, and NAWCADLKE. The Flight Deck Centerline LSFS Maintenance Man-Hours per Operating Hour (MMH/OH) derived from this analysis did not justify an increase in organizational level manpower. No intermediate level maintenance is required for the Flight Deck Centerline LSFS; therefore, no increase in intermediate level manpower was required.

(1) Watchstation Requirements. The Flight Deck Centerline LSFS operators are Airman (NEC 0000) assigned to the PRI-FLY. Operator duties consist of turning on the equipment and adjusting the flash intensity and speed of the runway centerline lighting. Operator skills are gained through On-the-Job Training (OJT).

(2) Maintenance Workload. The Flight Deck Centerline LSFS maintenance is performed by personnel from the EM rating assigned to V-2 Division or the Engineering Department.

b. Fresnel Lens Optical Landing System MK-6 MOD 3. The FLOLS MK-6 MOD 3 did not alter the manpower requirements at any of the three levels of maintenance. Current organizational level manning is sufficient to provide adequate coverage throughout the normal range of equipment operations, with a daily average operating period of 18 hours.

(1) Watchstation Requirements. The LSO workstation is currently manned by one LSO Navy Officer Billet Code (NOBC 8662) and one Airman (NEC 0000).

Currently the PRI-FLY and FLOLS equipment room monitoring equipment and setting controls are manned during flight operations and General Quarters (GQ) by an IC (NEC 4745) as follows:

WATCHSTATION REQUIREMENTS		
	CONDITION I	CONDITION FQ
Lens Tech / Supervisor	IC1-4745	IC1-4745
Lens PRI-FLY Operator	*	IC3-4745
	CONDITION I	CONDITION FQ
Lens Room Operator	IC3-4745	IC2-4745
Lens Technician	IC2-4745	*

* **Note:** Positions unmanned during indicated condition.

(2) Maintenance Workload. The FLOLS MK-6 MOD 3 maintenance is performed by ICs in V2 Division (IC3 and above). Estimates for Preventive Maintenance (PM) man-hours were based on the information obtained from the Maintenance Index Pages (MIPs) on the FLOLS MK-6 MOD 3 for the carriers USS Kitty Hawk (CV-63) and USS America (CV-66). Estimated Corrective Maintenance (CM) man-hours were based on ALRE Maintenance Program data obtained on the above carriers, and maintainability and reliability predictions given by Naval Air Engineering Center (NAVAIRENGCEN). The estimated maintenance man-hours per week are as follows:

RATE	NEC	PM	CM
IC1	4745	16.2	0.50
IC2	4745	17.1	0.51
IC3	4745	13.1	0.72
TOTALS:		46.4	1.73

(3) Recommended Manpower Requirements. Experience gained on the USS Saratoga (CV-60) and USS Kitty Hawk (CV-63) indicated that no increase in the ship's complement of maintenance and operating personnel was required. The following tables list the officer and enlisted personnel directly involved with the operation and maintenance of the FLOLS. LSO (NOBC 8662) requirements are not driven by the FLOLS but reflect LSO training plan requirements.

(a) Officer

NOBC	O-5	O-4	O-3	O-2	TOTAL
8618	1				1
8614		1			1
8662		1	9	7	17

(b) Enlisted

RATING/ NEC	E-7	E-6	E-5	E-4	DESIG STKR	E-3	TOTAL
IC 4745	1	2	2				5
IC 0000					6		6
AT 6673	1		2	3	2		8
AN 0000						1	1

c. Improved Fresnel Lens Optical Landing System MK-13 MOD 0. Once IFLOLS is installed and replaces FLOLS MK-6 MOD 3, the same individuals that are currently maintaining FLOLS will maintain IFLOLS. Therefore, IFLOLS will not alter the manpower requirements at any of the three levels of maintenance. Current organizational level manning is sufficient to provide adequate coverage throughout the normal range of equipment operations, with a daily average operating period of 16 hours.

d. Integrated Launch and Recovery Television Surveillance System. The ILARTS Control Room is manned during flight operations. The officer responsible for the control room during flight operations is assigned to the Air Department. An ILARTS Lens supervisor is responsible for the day-to-day operation of the control room. One operator is required to operate the various equipment in the control room. A maintenance person is required in the room as standby to perform emergency corrective maintenance. One person mans the island camera.

During periods when flight operations are not being conducted, the ILARTS maintenance personnel are responsible to the Air Department Maintenance Officer for routine PM and CM.

(1) Watchstation Requirements. All positions are manned during flight operations. One hour prior to the beginning of the day's launch or recovery operations, the ILARTS Control Console is turned on and checked by the Control Console Operator. The ILARTS remains in operation and is continually monitored by the Control Console Operator during all launch and recovery operations. Positions are be manned as follows:

STATION TITLE	RANK/ RATE	NOBC/ NEC	WARTIME GQ	PEACETIME CRUISING	
			I	II	III
ILARTS / Lens Supvr	IC2	4743	1	1	1
ILARTS Equip Oper	ICFN	4743	1	1	1
ILARTS Camera Oper	ICFN	0000	1	1	1

(2) Maintenance Workload. During periods when flight operations are not being conducted, the ILARTS maintenance personnel are responsible for PM and CM. The maintenance personnel rating and estimated maintenance man hours per week are as follows:

RATE	NEC	PM	CM	OTHER
IC1	4743	0.50	0.25	0.75
IC2	4743	1.25	0.50	1.75
IC3	4743	2.00	1.00	3.00
ICFN	4743	2.50	1.25	3.75
TOTALS:		6.25	3.00	9.25

(3) Recommended Minimum Manpower Requirements

RATE	NEC	QTY
IC1	4743	1
IC2	4743	1
IC3	4743	1
ICFN	4743	1

e. Landing Signal Officer Heads Up Display MK-1 MOD 0. Experience with the first operating installation of equipment on the USS America (CV-66) in April 1982 indicated that the current skill levels of shipboard LSOs, ICs, and ABE Hydraulic Mechanics were sufficient to operate and maintain the system on a regular basis. An increase in ship's personnel was not required. The IC operates and maintains the Display Subsystem and the control circuitry of the Hydraulic Lifting Unit Subsystem. The ABE Hydraulic Mechanic assists the ICs in maintaining the system hydraulics.

(1) Watchstation Requirements. All positions are manned full time during flight operations. One hour prior to beginning recovery operations the LSO HUD Console System is turned on and checked out by the LSO and an IC. The LSO HUD system remains in operation and is continually monitored by the LSO during recovery operations.

STATION TITLE	RATING	NOBC	WARTIME GQ	PEACETIME CRUISING	
			I	II	III
LSO Platform	LT	8662	2	2	2

(2) Maintenance Workload. During periods when flight operations are not being conducted, the FLOLS or IFLOLS and LRLS maintenance personnel are responsible for routine PM and CM. Estimates for PM maintenance man-hours are based on operating experience and a reliability centered maintenance study. Estimated CM man-hours are based on a study of reliability and maintainability predictions.

RATE	NEC	PM	CM
IC3	4745	0.50	0.25
ABE3	7006	0.70	0.25
TOTALS:		1.20	0.50

(3) Recommended Manpower Requirements. The existing manpower onboard CVs and CVNs is sufficient to handle LSO HUD. The following currently assigned personnel operate and maintain LSO HUD:

RANK/ RATE	NOBC/ NEC	QTY
LT	8662	2
IC3	4745	1
ABE3	7006	1

f. Long Range Line-Up System. In May 1990, NAVAIRSYSCOM PMA205, the Training Support Agent, conducted a Manpower, Personnel, and Training Analysis for the ICOLS, of which LRLS was originally a subsystem. The result of the analysis was that LRLS requires no new skill specialties or manning for operation and maintenance.

Organizational level maintenance manning is sufficient to provide adequate coverage throughout the normal range of equipment operations, with a daily operating period of sixteen hours. The LRLS maintenance is performed by ICs (NEC 4745) currently assigned to the FLOLS MK-6 MOD 3 (IC3 and above). The manning concept for the LRLS uses the billet requirements outlined in Part II of the Navy Training Plan entitled Quality Assurance/ Maintenance Program for ALRE (NTP Number A-50-8509, Approved, October 1986) as a billet baseline. No additional instructors are required for LRLS training.

(1) Watchstation Requirements. The LSO workstation is currently manned by an LSO (NOBC 8662) and an airman (NEC 0000). With the incorporation of LRLS new technology, system capabilities, and increased functions, an IC3 (NEC 4745) already assigned to V-2 division is required to man the LSO workstation in place of the airman.

Currently the PRI-FLY and FLOLS equipment room monitoring equipment and setting controls are manned during flight operations and GQ by ICs as follows:

STATION TITLE	RANK/ RATE	NOBC/ NEC	WARTIME GQ	PEACETIME CRUISING	
			I	II	III
LSO Workstation	LT	8662	1	1	1
LSO Workstation *	IC3 *	4745	1	1	1
PRI-FLY	IC3	4745	1	1	1
FLOLS Room	IC3	4745	1	1	1

* LRLS requirement

(2) Maintenance Workload. The LRLS maintenance is performed by ICs (NEC 4745) in V-2 division currently assigned to the FLOLS MK-6 MOD 3 (IC3 and above). Estimates for PM man-hours are based on the information obtained from a similar system called Horizon Reference Set (HRS) System, located in the Air Capable Ships Visual Landing Aids NTP A-50-9205/A dated 10 December 1993.

RATE	NEC	PM	CM
IC1	4745	0.02	0.07
IC2	4745	3.75	0.07
IC3	4745	3.63	0.00
TOTALS:		7.40	0.14

(3) Recommended Manpower Requirements

RANK/ RATE	NOBC/ NEC	QTY
LT	8662	1
IC1	4745	1
IC2	4745	1
IC3	4745	3

g. Manually Operated Visual Landing Aid System MK-1 MOD 2. An increase in ship's personnel was not required. The ICs assigned to operate and maintain the LRLS, FLOLS, or IFLOLS set up and maintain the MOVLAS. The MOVLAS is operated by the LSO.

(1) Watchstation Requirements. All positions are manned after setup by personnel assigned to operate and maintain the FLOLS or IFLOLS.

STATION TITLE	RANK/ RATE	NOBC/ NEC	WARTIME GQ	PEACETIME CRUISING	
			I	II	III
LSO Workstation	LT	8662	1	1	1
LSO Workstation	AN	0000	1	1	1
PRI-FLY	IC3	4745	1	1	1

FLOLS Room	IC3	4745	1	1	1
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(2) Maintenance Workload. The MOVLAS maintenance is performed by ICs in the V-2 division assigned to the FLOLS or IFLOLS.

RATE	NEC	PM	CM
IC3	4745	2.11	0.08
ICFN	0000	2.11	0.08
ICFN	0000	3.00	0.00
TOTALS:		7.22	0.16

(3) Recommended Manpower Requirements

RANK/ RATE	NOBC/ NEC	QTY
LT	8662	1
IC3	4745	2
ICFN	0000	2
AN	0000	1

h. Virtual Imaging Systems For Approach and Landing. TBD. Once TRPPM information becomes available, it will be incorporated into future NTSP updates.

i. Wind Measuring Indicating System. WMIS is activated during all underway periods and requires no manning or operator input.

(1) Watchstation Requirements. NA

(2) Maintenance Workload. ICs are responsible for routine PM and CM. Maintenance information is contained in applicable MRCs and technical manuals. The estimated maintenance man-hours per week are as follows:

RATE	NEC	PM	CM
IC2	0000	0.30	0.25
ICFN	0000	0.30	0.25

RATE	NEC	PM	CM
TOTALS:		0.60	0.50

(3) Recommended Quantitative/Qualitative Manpower Requirements.

The existing manpower onboard CVs and CVNs is sufficient to handle WMIS. The following currently assigned personnel operate and maintain WMIS:

RATE	NEC	QTY
IC2	0000	1
ICFN	0000	1

4. Training Concept. Aircraft Carrier Visual Landing Aid Systems Initial Training has been completed for Flight Deck Centerline LSFS, FLOLS, ILARTS, LSO HUD, MOVLAS, and WMIS. LRLS is scheduled to come on line in June 1999. Initial training will be provided upon installation of the LRLS. IFLOLS is scheduled to come on line in June 2001. Initial training will be provided upon installation of the IFLOLS. VISUAL is scheduled to come on line in FY02-FY04. As information becomes available it will be included into future updates to this NTSP.

Aircraft Carrier Visual Landing Aid Systems Follow-On Training for Flight Deck Centerline LSFS, FLOLS, ILARTS, LSO HUD, MOVLAS, and WMIS are currently being taught as follows:

- **Flight Deck Centerline Light Sequence Flashing System.** Flight Deck Centerline LSFS is taught through OJT.
- **Fresnel Lens Optical Landing System MK-6 MOD 3.** FLOLS is currently taught in C-670-2010, Optical Landing System Maintenance, at NATTC DET Lakehurst.
- **Improved Fresnel Lens Optical Landing System MK-13 MOD 0.** IFLOLS is expected to replace FLOLS in C-670-2010, Optical Landing System Maintenance at NATTC DET Lakehurst during FY00.
- **Integrated Launch and Recovery Television Surveillance System.** ILARTS is currently being taught in A-191-0011, ILARTS System Maintenance Technician, at Service Schools Command (SSC) Great Lakes.
- **Landing Signal Officer Heads Up Display MK-1 MOD 0.** LSO HUD is currently being taught in C-670-2010, Optical Landing System Maintenance, at NATTC DET Lakehurst.

- **Long Range Line-Up System.** LRLS is scheduled to come on line in June 1999. It will be included into C-670-2010, Optical Landing System Maintenance, at NATTC DET Lakehurst.
- **Manually Operated Visual Landing Aid System MK-1 MOD 2.** MOVLAS is currently being taught in C-670-2010, Optical Landing System Maintenance, at NATTC DET Lakehurst.
- **Virtual Imaging Systems For Approach and Landing.** VISUAL is scheduled to come on line in FY02-FY04. As it becomes available, more information will be included in future updates to this NTSP.
- **Wind Measuring Indicating System.** WMIS is currently being taught in A-651-0047, Propulsion Alarms and Indicating Systems Maintenance, at Fleet Training Center (FTC) Norfolk and FTC San Diego.

Selected Reserve personnel may earn maintenance NECs by attending formal training at NAMTRAGRU DETs providing a quota and funding are available, and the student is available to attend the training. Specific guidelines are contained in NAVPERS 18068F Volume II, Chapter IV, Navy Enlisted Classifications.

a. Initial Training

(1) Flight Deck Centerline Light Sequence Flasher System. Initial training was provided by CAFSU San Diego for the personnel aboard the USS Independence (CV-62) in August 1988. The initial training consisted of informal instructions presented on site to familiarize organizational level maintenance personnel with operation and maintenance procedures.

(2) Fresnel Lens Optical Landing System MK-6 MOD 3. Initial training was completed in March 1985.

(3) Improved Fresnel Lens Optical Landing System MK-13 MOD 0. ICs currently operating and maintaining the FLOLS will receive on-site initial training in the operation and maintenance of the IFLOLS. Initial training will be provided by the NAWC AD and contractor personnel for each activity during the installation of the IFLOLS on an as-required basis. NAWC AD technical personnel will provide operator and maintenance procedures or contractor personnel for ICs attached to V-2 Division. TECHEVAL and OPEVAL training was provided by NAWC AD technical personnel in September 1996.

(4) Integrated Launch and Recovery Television Surveillance System. Initial training for the ILARTS was completed in the 1980s as the system was being introduced to the fleet.

(5) Landing Signal Officer Heads Up Display MK-1 MOD 0. Initial training for the LSO HUD was completed in March 1985.

(6) Long Range Line-Up System. ICs currently operating and maintaining the FLOLS will receive on-site initial training in the operation and maintenance of the LRLS. The NAWCADLKE and contractor personnel will provide initial training for each ship and shore activity during the installation of the LRLS on an as-required basis. The NAWCADLKE or contractor personnel will provide operator and maintenance procedures for ICs attached to V-2 division. NAWCADLKE provided TECHEVAL training in September 1997.

(a) Operator. Initial operator training will be provided on-site by the NAWCADLKE and contractor personnel until LRLS training has been fully established.

(b) Maintenance

1 Organizational. NAWCADLKE representatives or contractor personnel will provide organizational level maintenance personnel on-site initial training on an as-required basis.

2 Intermediate. Intermediate level maintenance personnel aboard CVs and CVNs will interface with NAWCADLKE representatives for informal training.

3 Depot. An estimated one-week factory training course will be required for the contractor to teach depot level maintenance of the LRLS.

(c) Team. NA

(d) Officer. The LSO School at Naval Air Station (NAS) Oceana, Virginia, provides initial training for LSOs. Information concerning the LRLS will be supplied by NAWCADLKE to the LSO School as it becomes available. LSOs will interface with NAWCADLKE representatives for informal on-site training.

(e) Industrial Personnel. The LRLS contractor will provide NAWCADLKE representatives with the latest data concerning the LRLS. The NAWCADLKE and Naval Air Technical Training Center (NATTC) Detachment (DET) Lakehurst representatives will then become the Navy's SMEs for the LRLS and will provide technical assistance as required. An estimated one-week factory-training course will be required for the depot level maintenance of the LRLS.

(7) Manually Operated Visual Landing Aid System MK-1 MOD 2. Initial training for the MOVLAS was completed in the late 1970s.

(8) Virtual Imaging Systems For Approach and Landing. During the TRPPM analysis, existing training courses will be evaluated, and it will be determined if a stand-alone training course should be developed to provide the operator and maintainer with necessary skills for operation and maintenance. Once TRPPM information becomes available, it will be incorporated into future NTSP updates.

(9) Wind Measuring Indicating System. NAVAIRSYSCOM PMA205 had a WMIS course developed to provide initial training to instructors at FTC Norfolk, Virginia, and FTC San Diego, California. Currently both sites are awaiting Technical Training Equipment (TTE).

b. Follow-on Training. The operator and organizational maintenance follow-on training for the nine VLA systems varies for each system. Flight Deck Centerline LSFS follow-on training is gained through OJT. FLOLS MK-6 MOD 3, MOVLAS MK-1 MOD 2, and LSO HUD systems are currently being taught in the Optical Landing System Maintenance course, C-670-2010, at NATTC DET Lakehurst, New Jersey. In June 2001, IFLOLS MK-13 MOD 0, and in June 1999, LRLS will be added to the existing Optical Landing System Maintenance course C-670-2010. ILARTS follow-on training is currently being taught in the ILARTS System Maintenance Technician course, A-191-0011, at SSC Great Lakes, Illinois. VISUAL follow-on training is yet to be determined. WMIS follow-on training is currently being taught in the Propulsion Alarms course, A-651-0047, at FTC Norfolk and FTC San Diego.

(1) Flight Deck Centerline Light Sequence Flasher System. There is no follow-on training for the Flight Deck Centerline LSFS. All operator and maintenance skills will be gained through OJT.

(2) Fresnel Lens Optical Landing System MK-6 MOD 3

(a) Operator. NA

(b) Maintenance

1) Organizational Level. FLOLS training is included in the following operator and organizational level maintenance training courses:

Title	Optical Landing System Maintenance
CIN	C-670-2010
Model Manager..	NATTC Det Lakehurst
Description	Provides selected personnel with specialized instruction in the operation and maintenance of the FLOLS MK-6 MOD 3, MOVLAS MK-1 MOD 2, the LSO HUD System, and the LRLS.
Location	NATTC Det Lakehurst
Length	68 days
RFT date	Currently available. Will include LRLS in June 1999 and IFOLS in June 2001.
Skill identifier	IC NEC 4745

TTE/TD	Refer to IV.A.1 for TTE. TD is NA.
Prerequisites	A-623-0105, Interior Communications Electrician Class A School, IC3 or above, and normal color perception as measured by Farnsworth Lantern (FALANT) test.

2) Intermediate Level. ICs and AIMD personnel perform only limited intermediate level maintenance; therefore, no formal training was be required.

(c) Team. NA

(d) Officer. The following courses have already been modified to include the FLOLS MK-6 MOD 3:

Title	Initial Fighter Ground Training
CIN	D-2G-0001
Model Manager.....	LSO School, NAS Oceana, Virginia Beach, Virginia
Description	Introduction to fleet LSO administrative and operational responsibilities including shore-based and ship-based equipment, glideslope geometry, aircraft recovery bulletins, aircraft characteristics, waving concepts and techniques, conduct of field carrier landing practice, and Automated Performance Assessment and Readiness Training System (APARTS).
Location	LSO School, NAS Oceana
Length	10 days
RFT date	Currently available
Skill identifier.....	NA
TTE/TD	TTE is NA. Refer to IV.A.2 for TD.
Prerequisites.....	Designation as an LSO trainee per LSO Naval Air Training and Operating Procedures Standardization (NATOPS), 1310 or 1315 designator, and a secret security clearance.

(e) **Industrial Personnel.** NA

(3) Improved Fresnel Lens Optical Landing System MK-13 MOD 0

(a) **Operator.** NA

(b) **Maintenance**

1) Organizational Level. IFLOLS MK-13 MOD 0

organizational level operation and maintenance training will require a major modification to the existing Optical Landing System Maintenance course. Change in course length is to be determined by June 2001.

Title	Optical Landing System Maintenance
CIN	C-670-2010
Model Manager..	NATTC Det Lakehurst
Description	Provides selected personnel with specialized instruction in the operation and maintenance of the IFLOLS MK-13 MOD 0, MOVLAS MK-1 MOD 2, the LSO HUD System, and the LRLS at the Journeyman level.
Location	NATTC Det Lakehurst
Length	Currently 68 days. Subject to change once IFLOLS is added.
RFT date	Currently available. Will include IFLOLS in June 2001.
Skill identifier	IC NEC 4745
TTE/TD	IFLOLS TTE/TD is to be determined
Prerequisites	A-623-0105, Interior Communications Electrician Class A School, IC3 or above, and normal color perception as measured by Farnsworth Lantern (FALANT) test.

2) Intermediate Level. ICs and AIMD personnel will be performing only limited intermediate level maintenance; therefore, no formal training will be required.

(c) **Team.** NA

include the IFLOLS:

(d) **Officer.** The following courses will require modifications to

Title	Intermediate Fighter Ground Training
CIN	D-2G-0001
Model Manager	LSO School, NAS Oceana
Description	Introduction to fleet LSO administrative and operational responsibilities including shore-based and ship-based equipment, glideslope geometry, aircraft recovery bulletins, aircraft characteristics, waving concepts and techniques, conduct of field carrier landing practice, and APARTS.
Location	LSO School, NAS Oceana
Length	10 days
RFT date	Currently available. Will include IFLOLS in June 2001.
Skill identifier.....	NA
TTE/TD	IFLOLS TTE/TD is to be determined.
Prerequisites.....	Designation as an LSO trainee per LSO NATOPS, 1310 or 1315 designator, and a secret security clearance.

Title	Advanced Fighter Ground Training
CIN	D-2G-0002
Model Manager	LSO School, NAS Oceana
Description	Instruction in administrative and operational responsibilities of an airwing staff LSO including platform strategy, barricade, pitching deck MOVLAS recoveries, LSO training and evaluation, and APARTS.
Location	LSO School, NAS Oceana
Length	3 days

RFT date	Currently available. Will include IFLOLS in June 2001.
Skill identifier.....	NA
TTE/TD.....	IFLOLS TTE/TD to be determined.
Prerequisites.....	Designation as an LSO trainee per LSO NATOPS, 1310 or 1315 designator, and a secret security clearance.

(e) Industrial Personnel. NA

(4) Integrated Launch and Recovery Television Surveillance System

(a) Operation and Maintenance

1) Organizational Level. ILARTS training is included in the following operator and organizational level maintenance training courses.

Title	ILARTS System Maintenance Technician
CIN	A-191-0011
Model Manager	SSC, Great Lakes, Illinois
Description	Provides ICs with the knowledge and the skills necessary to perform organizational level preventive and corrective maintenance, and operate the ILARTS. Also provides the ability to perform all authorized systems operating and maintenance procedures, under limited supervision on board aircraft carriers, for all ship readiness conditions, in port and underway.
Location	SSC Great Lakes
Length	103 days
RFT date	Currently available
Skill identifier	IC NEC 4743
TTE/TD	Refer to IV.A.1 for TTE. TD is NA.

Prerequisites..... A-623-0105, Interior Communications Electrician Class A School and IC E-3 through E-8.

2 Intermediate Maintenance. ICs and AIMD personnel perform only limited intermediate level maintenance; therefore, no formal training is required.

(b) Team. NA

(c) Officer. The NAWCADLKE supplied ILARTS information to the LSO School, NAS Oceana.

(d) Industrial Personnel. Skills necessary to support the ILARTS already exist at the Naval shipyards, therefore, additional training for industrial personnel is not required.

(5) Landing Signal Officer Heads Up Display MK-1 MOD 0

(a) Operation and Maintenance

1) Organizational Level

Title	Optical Landing System Maintenance
CIN	C-670-2010
Model Manager..	NATTC Det Lakehurst
Description	Provides selected personnel with specialized instruction in the operation and maintenance of the IFLOLS MK-13 MOD 0 or FLOLS MK-6 MOD 0, the MOVLAS MK-1 MOD 2, the LSO HUD, and the LRLS.
Location	NATTC Det Lakehurst
Length	68 days
RFT date	Currently available. Will include LRLS in June 1999 and IFLOLS in June 2001.
Skill identifier	IC NEC 4745
TTE/TD	Refer to IV.A.1 for TTE. TD is NA.
Prerequisite.....	A-623-0105, Interior Communications Electrician Class A School, IC3 or above, and normal color perception as measured by FALANT test.

Title	ALRE Maintenance Technician
CIN	C-604-2028
Model Manager..	NATTC DET Lakehurst
Description	To provide designated ABE personnel with the technical and practical knowledge to perform organizational maintenance on ALRE with limited supervision in a shipboard environment.
Location	NATTC DET Lakehurst
Length	80 days
RFT date	Currently available
Skill identifier	ABE NEC 7006
TTE/TD	Refer to IV.A.1 for TTE. TD is NA.
Prerequisites.....	E-5 through E-9 ABE personnel, or E-6 through E-9 Billet U.S. Navy personnel completing one full tour of sea duty, and possessing one of the following NECs: 7002, 7003, 7004, or 7005.

2) Intermediate Maintenance. ICs perform only limited intermediate level maintenance; therefore, no formal training is required.

(b) Team. NA

(c) Officer

Title	Intermediate Fighter Ground Training
CIN	D-2G-0001
Model Manager.....	LSO School, NAS Oceana

Description	Introduction to fleet LSO administrative and operational responsibilities including shore-based and ship-based equipment, glideslope geometry, aircraft recovery bulletins, aircraft characteristics, waving concepts and techniques, conduct of field carrier landing practice, and APARTS.
Location	LSO School, NAS Oceana
Length	10 days
RFT date	Currently available. Will include LRLS in June 1999 and IFLOLS in June 2001.
Skill identifier.....	NA
TTE/TD	TTE is NA. Refer to IV.A.2 for TD.
Prerequisites.....	Designation as an LSO trainee per LSO NATOPS, 1310 or 1315 designator, and a secret security clearance.

Title	Advanced Fighter Ground Training
CIN	D-2G-0002
Model Manager.....	LSO School, NAS Oceana
Description	Instruction in administrative and operational responsibilities of an airwing staff LSO including platform strategy, barricade, pitching deck MOVLAS recoveries, LSO training and evaluation, and APARTS.
Location	LSO School, NAS Oceana
Length	3 days
RFT date	Currently available. Will include LRLS in June 1999 and IFLOLS in June 2001.
Skill identifier.....	NA
TTE/TD	TTE is NA. Refer to IV.A.2 for TD.
Prerequisites.....	Designation as an LSO trainee per LSO NATOPS, 1310 or 1315 designator, and a secret security clearance.

Title	Fleet Replacement Squadron Training Completion
CIN	D-2G-0003
Model Manager.....	LSO School, NAS Oceana
Description	Instruction in administrative and operational responsibilities of a training LSO including waving techniques and considerations, conduct of ground training and field carrier landing practice, initial carrier qualification requirements, Fleet Readiness Squadron (FRS) or Training Command (TRACOM) instructional philosophy, and FRS APARTS.
Location	LSO School, NAS Oceana
Length	3 days
RFT date	Currently available. Will include LRLS in June 1999 and IFLOLS in June 2001.
Skill identifier.....	NA
TTE/TD	TTE is NA. Refer to IV.A.2 for TDs.
Prerequisites.....	Initial formal ground training, squadron LSO designation 1310 or 1315, and a secret security clearance.

(d) Industrial Personnel. Skills necessary to support the LSO HUD already exist at the Naval shipyards; therefore additional training for industrial personnel is not required.

(6) Long Range Line-Up System. Modifications to A-623-0105, Interior Communications Electrician Class A School course curriculum are required to include the LRLS theory and operation. Modifications to the existing C-670-2010, Optical Landing System Maintenance course for the IC (NEC 4745) rating, and modifications to the LSO School curriculum are also required. Modifications to existing courses will not result in a change to course length.

(a) Operation and Maintenance

1) Organizational Level. LRLS training will be included in the following operator and organizational level maintenance training courses.

Title	Optical Landing System Maintenance
CIN	C-670-2010
Model Manager..	NATTC DET Lakehurst
Description	Provides selected personnel with specialized instruction in the operation and maintenance of the IFLOLS MK-13 MOD 0 or FLOLS MK-6 MOD 3, the MOVLAS MK-1 MOD 2, the LSO HUD system, and LRLS.
Location	NATTC DET Lakehurst
Length	68 days
RFT date	Currently available. Will include LRLS in June 1999 and IFLOLS in June 2001.
Skill identifier	IC NEC 4745
TTE/TD	Refer to IV.A.1 for TTE. TD is NA.
Prerequisites	A-623-0105, Interior Communications Electrician Class A School, IC3 or above, and normal color perception as measured by FALANT test.

2) Intermediate Level. ICs and AIMD personnel will be performing only limited intermediate level maintenance; therefore, no formal training will be required.

(b) Officer. Modifications to the following LSO School courses will be required to include LRLS operation:

Title	Intermediate Fighter Ground Training
CIN	D-2G-0001
Model Manager.....	LSO School, NAS Oceana

Description	Introduction to fleet LSO administrative and operational responsibilities including shore-based and ship-based equipment, glideslope geometry, aircraft recovery bulletins, aircraft characteristics, waving concepts and techniques, conduct of field carrier landing practice, and APARTS.
Location	LSO School, NAS Oceana
Length	10 days
RFT date	Currently available. Will include LRLS in June 1999 and IFLOLS in June 2001.
Skill identifier.....	NA
TTE/TD	TTE is NA. Refer to IV.A.2 for TD.
Prerequisites.....	Designation as an LSO trainee per LSO NATOPS, 1310 or 1315 designator, and a secret security clearance.

Title	Advanced Fighter Ground Training
CIN	D-2G-0002
Model Manager.....	LSO School, NAS Oceana
Description	Instruction in administrative and operational responsibilities of an airwing staff LSO including platform strategy, barricade, pitching deck MOVLAS recoveries, LSO training and evaluation, and APARTS.
Location	LSO School, NAS Oceana
Length	3 days
RFT date	Currently available. Will include LRLS in June 1999 and IFLOLS in June 2001.
Skill identifier.....	NA
TTE/TD	TTE is NA. Refer to IV.A.2 for TD.
Prerequisites.....	Designation as an LSO trainee per LSO NATOPS, 1310 or 1315 designator, and a secret security clearance.

Title	Fleet Replacement Squadron Training Completion
CIN	D-2G-0003
Model Manager.....	LSO School, NAS Oceana
Description	Instruction in administrative and operational responsibilities of a training LSO including waving techniques and considerations, conduct of ground training and field carrier landing practice, initial carrier qualification requirements, FRS or TRACOM instructional philosophy, and FRS APARTS.
Location	LSO School, NAS Oceana
Length	3 days
RFT date	Currently available. Will include LRLS in June 1999 and IFLOLS in June 2001.
Skill identifier.....	NA
TTE/TD	TTE is NA. Refer to IV.A.2 for TDs.
Prerequisites.....	Designation as an LSO trainee per LSO NATOPS, 1310 or 1315 designator, and a secret security clearance.

(c) **Industrial Personnel.** The contractor will provide depot level maintenance for the LRLS.

(7) Manually Operated Visual Landing Aid System MK-1 MOD 2

(a) Operation and Maintenance

1) Organizational Level

Title	Optical Landing System Maintenance
CIN	C-670-2010
Model Manager..	NATTC DET Lakehurst

Description	Provides selected personnel with specialized instruction in the operation and maintenance of the IFLOLS MK-13 MOD 0 or FLOLS MK-6 MOD 3, the MOVLAS MK-1 MOD 2, the LSO HUD, and the LRLS at the journeyman level.
Location	NATTC DET Lakehurst
Length	68 days
RFT date	Currently available for MOVLAS
Skill identifier	IC NEC 4745
TTE/TD	Refer to IV.A.1 TTE. TD is not required.
Prerequisites	A-623-0105, Interior Communications Electrician Class A School, IC3 or above, and normal color perception as measured by FALANT test.

2) Intermediate Maintenance. Intermediate level maintenance training is not required to support the MOVLAS.

(b) Team. NA

(c) Officer

Title	Initial Fighter Ground Training
CIN	D-2G-0001
Model Manager.....	LSO School, NAS Oceana
Description	Introduction to fleet LSO administrative and operational responsibilities including shore-based and ship-based equipment, glideslope geometry, aircraft recovery bulletins, aircraft characteristics, waving concepts and techniques, conduct of field carrier landing practice, and APARTS.
Location	LSO School, NAS Oceana
Length	10 days
RFT date	Currently available

Skill identifier.....	NA
TTE/TD	TTE is NA. Refer to IV.A.2 for TDs.
Prerequisites.....	Designation as LSO trainee per LSO NATOPS, 1310 or 1315 designator, and a secret security clearance.
Title	Advanced Fighter Ground Training
CIN	D-2G-0002
Model Manager.....	LSO School, NAS Oceana
Description	Instruction in administrative and operational responsibilities of an airwing staff LSO including platform strategy, barricade, pitching deck MOVLAS recoveries, LSO training and evaluation, and APARTS.
Location	LSO School, NAS Oceana
Length	3 days
RFT date	Currently available
Skill identifier.....	NA
TTE/TD.....	TTE is NA. Refer to IV.A.2 for TD.
Prerequisites.....	Initial Formal Ground Training and Wing LSO designation, 1310 or 1315 designator, and a secret security clearance.
Title	Fleet Replacement Squadron Training Completion
CIN	D-2G-0003
Model Manager.....	LSO School, NAS Oceana

Description	Instruction in administrative and operational responsibilities of a training LSO including waving techniques and considerations, conduct of ground training and field carrier landing practice, initial carrier qualification requirements, FRS or TRACOM instructional philosophy, and FRS APARTS.
Location	LSO School, NAS Oceana
Length	3 days
RFT date	June 1999
Skill identifier.....	NA
TTE/TD.....	TTE is NA. Refer to IV.A.2 for TD.
Prerequisites.....	Initial formal ground training, squadron LSO designation 1310 or 1315, and a secret security clearance.

(d) Industrial Personnel. Skills necessary to support the MOVLAS already exist at the Naval shipyards, therefore additional training for industrial personnel is not required.

(8) Virtual Imaging Systems For Approach and Landing. TBD. Once TRPPM information becomes available, it will be incorporated into future NTSP updates.

(9) Wind Measuring Indicating System

(a) Operator. NA

(b) Organizational and Intermediate Maintenance. Due to identified training deficiencies, WMIS organizational and intermediate maintenance was added to the Propulsion Alarms and Indicating Systems Maintenance course, A-651-0047, per Training Project Plan serial # 1500T23313/400 dated 12 August 1996. Currently FTC Norfolk and FTC San Diego are teaching WMIS but without the use of a WMIS lab due to lack of TTE. (Refer to *Part VI - Actions/Decisions Required.*)

Title	Propulsion Alarms And Indicating Systems Maintenance
CIN	A-651-0047
Model Manager	FTC Norfolk

Description	Provides organizational and intermediate level maintenance personnel with the knowledge and skills necessary to support the Type “B” and Type “F” WMIS. Also provides skills to perform PM and CM on Pressure and Temperature Alarm Sensors, Alarm Panels and Switchboards, McNabb Salinity Indicating Level Alarm and Indicating System, and various other engine room alarms on Marine Propulsion Plants.
Locations	FTC Norfolk and FTC San Diego
Length	31 days
RFT date	Currently available
TTE/TD	Refer to section IV. A.1 for TTE. TD is NA.
Prerequisites	A-623-0105, Interior Communications Electrician Class A School, normal color perception as measured by FALANT test, and six months fleet experience working with Propulsion Alarm and Indicating Systems.

(c) Team. NA

(d) Officer. NA

(e) Industrial Personnel. Skills necessary to support the WMIS already exist at the Naval shipyards; therefore additional training for industrial personnel is not required.

c. Student Profiles

SKILL IDENTIFIER	PREREQUISITE SKILL AND KNOWLEDGE REQUIREMENTS
NOBC 8662	Qualified fixed-wing pilot
ABE 7006	C-604-2012, Aviation Boatswain’s Mate Launching and Recovery Equipment Class A1
AT 6673	C-100-2020, Avionics Common Core Class A1 C-100-2017, Avionics Technician I Level Class A1

SKILL IDENTIFIER	PREREQUISITE SKILL AND KNOWLEDGE REQUIREMENTS
EM 4745	A-662-0159 Electrician's Mate A School Pipeline
IC 4743 and 4745	A-623-0105, Interior Communications Electrician Class A

d. Training Pipelines

(1) Flight Deck Centerline Light Sequence Flasher System. No new training tracks or pipelines were required due to the installation of the Flight Deck Centerline LSFS.

(2) Fresnel Lens Optical Landing System MK-6 MOD 3. No new training tracks or pipelines were required due to the installation of FLOLS.

(3) Improved Fresnel Lens Optical Landing System MK-13 MOD 0. No new training tracks or pipelines will be required due to the introduction of the IFLOLS. There will be no increase to existing course lengths due to the incorporation of IFLOLS information. Modifications to the following courses will be required.

- C-670-2010, Optical Landing System Technician
- D-2G-0001, LSO Initial Ground Training
- D-2G-0002, LSO Advanced Formal Ground Training
- D-2G-0003, LSO Formal Ground Training

(4) Integrated Launch and Recovery Television Surveillance System. No new training tracks or pipelines were required due to the installation of ILARTS.

(5) Landing Signal Officer Heads Up Display MK-1 MOD 0. No new training tracks or pipelines were required due to the installation of the LSO HUD.

(6) Long Range Line-Up System. No new training tracks or pipelines will be required due to the introduction of the LRLS. There will be no increase to existing course lengths due to the incorporation of LRLS information. Modifications to the following courses will be required.

- A-623-0105, Interior Communications Electrician Class A School
- C-670-2010, Optical Landing System Technician
- D-2G-0001, LSO Initial Ground Training
- D-2G-0002, LSO Advanced Formal Ground Training
- D-2G-0003, LSO Formal Ground Training

(7) Manually Operated Visual Landing Aid System MK-1 MOD 2.

No new training tracks or pipelines were required due to the installation of the MOVLAS.

(8) Virtual Imaging Systems For Approach and Landing. TBD. Once

TRPPM information becomes available, it will be incorporated into future NTSP updates.

(9) Wind Measuring Indicating System. No new training tracks or

pipelines were required due to the installation of the WMIS.

I. ON-BOARD (IN-SERVICE) TRAINING

1. Proficiency or Other Training Organic to the New Development. This paragraph is NA to all nine systems contained in this NTSP.

2. Personnel Qualification Standards

a. Flight Deck Centerline Light Sequence Flasher System. EM Personnel Qualification Standards (PQS) were updated to reflect the new requirements of Flight Deck Centerline LSFS. The PQS Development Group, Naval Education and Training Center, Pensacola, Florida, developed the PQS.

b. Fresnel Lens Optical Landing System MK-6 MOD 3. The IC PQS were updated to reflect the new requirements of the FLOLS MK-6 MOD 3. The PQS Development Group, Naval Education and Training Center, developed the PQS.

c. Improved Fresnel Lens Optical Landing System MK-13 MOD 0. IC PQS will be developed to reflect the new requirements of IFLOLS. The PQS Development Group, Naval Education and Training Center, will develop the PQS in FY01.

d. Integrated Launch and Recovery Television Surveillance System. The PQS Development Group, Naval Education and Training Center, developed PQS for the ILARTS IC.

e. Landing Signal Officer Heads Up Display MK-1 MOD 0. IC and ABE PQS were developed to reflect the new requirements of LSO HUD, MK-1 MOD 0. The PQS Development Group, Naval Education and Training Center, developed the PQS.

f. Long Range Line-Up System. IC PQS will be updated to reflect the new requirements of the LRLS. The PQS Development Group, Naval Education and Training Center, will develop the PQS in June 1999.

g. Manually Operated Visual Landing Aid System MK-1 MOD 2. IC PQS was developed to reflect the new requirements of MOVLAS, MK-1 MOD 2. The PQS Development Group, Naval Education and Training Center, developed the PQS.

h. Virtual Imaging Systems For Approach and Landing. TBD. Once TRPPM information becomes available, it will be incorporated in future NTSP updates.

i. Wind Measuring Indicating System. PQS for the WMIS on board aircraft carriers was not developed.

3. Other On-Board or In-service Training Packages. All nine systems contained in this NTSP use OJT onboard CVs and CVNs.

J. LOGISTICS SUPPORT

1. Manufacturer and Contract Numbers

a. Flight Deck Centerline Light Sequence Flasher System. The All American Engineering Company manufactured an initial number of Flight Deck Centerline LSFSs.

CONTRACT NUMBER	MANUFACTURER	ADDRESS
Information not available	All American Engineering Company	725 Dawson Drive Newark, DE 19714

b. Fresnel Lens Optical Landing System MK-6 MOD 3. S. W. Electronics and Manufacturing Corporation manufactured FLOLS.

CONTRACT NUMBER	MANUFACTURER	ADDRESS
Information not available	S. W. Electronics and Manufacturing Corporation	619 Hollywood Avenue Cherry Hill, NJ 08002-2822

c. Improved Fresnel Lens Optical Landing System MK-13 MOD 0. NAWCADLKE manufactured the IFLOLS EDM. Production systems will be manufactured by Hughes Technical Services Incorporated.

CONTRACT NUMBER	MANUFACTURER	ADDRESS
To be determined	Hughes Technical Services Incorporated	NAWC Transition Team 6125 East 21 Street Indianapolis, IN 46219

d. Integrated Launch and Recovery Television Surveillance System. There are various ILARTS manufacturers under NAWCADLKE cognizance and specification control.

CONTRACT NUMBER	MANUFACTURER	ADDRESS
Information not available	Textronix, Incorporated	Textronix Inc. Annandale, VA 22003
Information not available	COHU, Incorporated	COHU, Inc. Electronics Division 5755 Kearny Villa Drive San Diego, CA 92138

e. Landing Signal Officer Heads Up Display MK-1 MOD 0. Pacific Missile Test Center manufactured all current fleet assets.

CONTRACT NUMBER	MANUFACTURER	ADDRESS
Information not available	Pacific Missile Test Center, now called NAWC Weapons Division	NAWC WD Point Mugu, CA 93042

f. Long Range Line-Up System. Contract award for LRLS EDMs was December 1996. Contract award for production systems is estimated to be in May 1999. Delivery of production systems is estimated to be in May 2000.

CONTRACT NUMBER	MANUFACTURER	ADDRESS
N68335-97-C-0014	Raytheon E-Systems	Raytheon E-Systems 1 South Los Carneros Road Goleta, CA 93117

g. Manually Operated Visual Landing Aid System MK-1 MOD 2. The Oxford Corporation manufactured MOVLAS.

CONTRACT NUMBER	MANUFACTURER	ADDRESS
Information not available	Oxford Corporation, a subsidiary of American Precision Industries, Incorporated	Oxford Corporation Buffalo, NY 14225

h. Virtual Imaging Systems For Approach and Landing. VISUAL program contract information will be provided in future updates to this NTSP.

i. Wind Measuring Indicating System. Belfort Instrument Inc., Baltimore, Maryland, initially manufactured the WMIS. Currently a new prototype for type F WMIS transmitter speed assembly is being developed by NAWCADLKE.

CONTRACT NUMBER	MANUFACTURER	ADDRESS
N68335-97C-0043	Belfort Instrument Incorporated	Belfort Instrument Incorporated 727 South Wolfe Street Baltimore, MD 21231

2. Program Documentation

a. Flight Deck Centerline Light Sequence Flasher System. NAWCADLKE has not developed or planned an ILSP for delivery.

b. Fresnel Lens Optical Landing System MK-6 MOD 3. No ILSP was developed for the FLOLS; however, an updated Operational Logistics Support Plan (OLSP), NAEC 51-8044 dated 30 December 1987, has been prepared and is available.

c. Improved Fresnel Lens Optical Landing System MK13 MOD 0. NAWCADLKE developed ILSP NAWCADLKE-182093001, dated 18 August 1994. An updated IFLOLS ILSP was approved in October 1998.

d. Integrated Launch and Recovery Television Surveillance System. NAWCADLKE developed an ILARTS ILSP NAEC-MISC-91-ORO73, dated 12 January 1984.

e. Landing Signal Officer Heads Up Display MK-1 MOD 0. NAWCADLKE developed an LSO HUD ILSP NAEC-MISC-91-OR020, dated 23 April 1980.

f. Long Range Line-Up System. NAWCADLKE developed an updated LRLS ILSP, NAWCADLKE-ILSP-92057A, approved December 1997.

g. Manually Operated Visual Landing Aid System MK-1 MOD 2.

NAWCADLKE has not developed or planned an ILSP for delivery. NAWCADLKE developed a Maintenance Plan NAWCADLKE-M84096002, approved 4 April 1996.

h. Virtual Imaging Systems For Approach and Landing.

NAWCADLKE developed ILSP NAWCADLKE-184097001, dated 12 June 1997.

i. Wind Measuring Indicating System.

NAWCADLKE has not developed or planned an ILSP for delivery.

3. Technical Data Plan

a. Flight Deck Centerline Light Sequence Flasher System.

Flight Deck Centerline LSFS initial training was done at each operational site and operator and maintenance training is gained through OJT. Therefore, the following items that are required for Flight Deck Centerline LSFS are available, have been delivered, and are only listed below:

(1) Operation and Maintenance Manual. A Shipboard Operation and Maintenance Manual with Illustrated Parts Breakdown for Flight Deck Centerline LSFS (NAVAIR 51-50ABA-5) has been prepared by NAWC AD in work package format (MIL-M-81927). It has been developed per a Technical Manual Contract Requirement (TMCR) #33-94 generated by the command formerly known as Naval Air Technical Services Facility (NAVAIRTECHSERVFAC), now the Naval Air Technical Data and Engineering Service Command (NATEC). All manuals are available and listed in element IV.B.3 of this NTSP.

(2) Maintenance Index Pages. MIP 4921/RDL is also available.

b. Fresnel Lens Optical Landing System MK-6 MOD 3. All manuals are available and listed in element IV.B.3 of this NTSP.

c. Improved Fresnel Lens Optical Landing System MK-13 MOD 0. The following items are required prior to fielding the IFLOLS:

(1) Operation and Maintenance Manual. A Shipboard Operation and Maintenance Manual with Illustrated Parts Breakdown (IPB) (NAVAIR 51-40ABA-21) has been prepared by NAWC AD in work package format (MIL-M-81927). It has been developed per a TMCR #33-94 generated by the NAVAIRTECHSERVFAC. Production configuration changes will be incorporated into this manual by December 1999.

(2) Depot Maintenance Manual. A Depot Maintenance Manual (NAVAIR 51-40ABA-22) will also be prepared by NAWC AD, in work package format, during the production phase of the acquisition program and be completed by October 2001.

(3) Maintenance Requirement Cards. NAWC AD prepared MRCs for IFLOLS per MIL-P-24534. MRC tasking was determined through the Logistic Support Analysis

process and MIL-STD-2173 Reliability Centered Maintenance guide. MRCs were validated August 1997.

d. Integrated Launch and Recovery Television Surveillance System. All manuals are available and listed in element IV.B.3 of this NTSP.

e. Landing Signal Officer Heads Up Display MK-1 MOD 0. All manuals are available and listed in element IV.B.3 of this NTSP.

f. Long Range Line-Up System

(1) Operation and Maintenance Manual. The Operation and Maintenance technical manual required to support the LRLS will be a commercial manual and will be developed by Raytheon E-Systems per the TMCR 41-96 in NAWCADLKE-ILSOW92057A. One manual outline, one reproducible copy, one direct image copy, and one digital copy will be furnished to the Navy. The technical manual number is NAVAIR 51-50ABA-6. The formal technical manual will be available in fourth quarter FY99.

(2) Maintenance Requirements Cards. The MRCs will be developed by NAWCADLKE and will be per MIL-P-24534A (Navy). MRC tasking will be determined through Fleet experience with the currently installed system. They will be validated on the at-sea verification test ship in May 2000.

g. Manually Operated Visual Landing Aid System MK-1 MOD 2. All manuals are available and listed in element IV.B.3 of this NTSP.

h. Virtual Imaging Systems For Approach and Landing

(1) Operation and Maintenance Manual. The contractor will provide IPB with exploded view drawings in FY01.

(2) Maintenance Requirements Cards. MRC double-side, double-density, floppy disk using the Knowledge Based Authorizing System (KBAS), a government supplied software, will be validated and verified by NAWCADLKE.

i. Wind Measuring Indicating System. All manuals are available and listed in element IV.B.3 of this NTSP.

4. Test Sets, Tools, and Test Equipment

a. Flight Deck Centerline Light Sequence Flasher System. There is no special test equipment required. Common test equipment to support the Flight Deck Centerline LSFS consists of a Digital Multimeter 8125A-01 or equivalent. Common hand tools are used to support the Flight Deck Centerline LSFS.

b. Fresnel Lens Optical Landing System MK-6 MOD 3. All special tools and test equipment needed to install, service, and troubleshoot the IFLOLS are listed in element IV.A.1. of this NTSP.

c. Improved Fresnel Lens Optical Landing System MK-13 MOD 0. There are no specific test sets, tools, test equipment, Common Support Equipment or Peculiar Support Equipment anticipated for IFLOLS.

d. Integrated Launch and Recovery Television Surveillance System. All special tools and test equipment needed to install, service, and troubleshoot the ILARTS are listed in element IV.A.1. of this NTSP.

e. Landing Signal Officer Heads Up Display MK-1 MOD 0. Special tools are not required to service the LSO HUD system; common hand tools suffice. A test simulator, NAEC Part Number A/E-24T-145, is provided for each system installation. It is used for troubleshooting and periodic calibration of the console displays. At times, a digital voltmeter and a two-channel portable oscilloscope may be required to perform corrective maintenance.

f. Long Range Line-Up System. There are no specific test sets, tools, test equipment, Common Support Equipment or Peculiar Support Equipment anticipated for LRLS.

g. Manually Operated Visual Landing Aid System MK-1 MOD 2. Special tools are not required for the operation, servicing, and overhaul of the MOVLAS. The common tools and equipment required are available.

h. Virtual Imaging Systems For Approach and Landing. Specific test sets, tools, and test equipment have not been identified to date. As this information becomes available it will be included in future updates to this NTSP.

i. Wind Measuring Indicating System. Special tools and test equipment are listed in the element IV.A.1. of this NTSP.

5. Repair Parts

a. Flight Deck Centerline Light Sequence Flasher System. NAWCADLKE provided interim supply support until the Material Support Date (MSD) of January 1993. The Naval Inventory Control Point (NAVICP) Philadelphia, Pennsylvania, provides formal supply support after MSD.

b. Fresnel Lens Optical Landing System MK-6 MOD 3. The NAVICP Philadelphia provisioned the FLOLS MK-6 MOD 3 in consonance with the approved OLSP and Maintenance Plan.

c. Improved Fresnel Lens Optical Landing System MK-13 MOD 0. The proposed MSD is June 2000.

d. Integrated Launch and Recovery Television Surveillance System. Supply support for the ILARTS is currently available through the NAVICP Mechanicsburg, Pennsylvania.

e. Landing Signal Officer Heads Up Display MK-1 MOD 0. Formal supply support for the LSO HUD is currently available through NAVICP Philadelphia.

f. Long Range Line-Up System. The hardware contractor will provide interim supply support until the projected MSD of May 1999.

g. Manually Operated Visual Landing Aid System MK-1 MOD 2. Formal supply support for the MOVLAS is currently available through NAVICP Philadelphia.

h. Virtual Imaging Systems For Approach and Landing. The requirement for spares and repair parts has not yet been determined. Once this information becomes available, it will be incorporated in future NTSP updates. The projected MSD for VISUAL is December 2004.

i. Wind Measuring Indicating System. Formal supply support for the WMIS is currently available through the NAVICP Mechanicsburg.

6. Human Systems Integration. NA

K. SCHEDULES

1. Installation and Delivery Schedules

a. Flight Deck Centerline Light Sequence Flasher System. Currently the Flight Deck Centerline LSFS is installed on all commissioned CVs and CVNs.

b. Fresnel Lens Optical Landing System MK-6 MOD 3. Currently the FLOLS is installed on all commissioned CVs and CVNs.

c. Improved Fresnel Lens Optical Landing System MK-13 MOD 0. Thirty-three production IFLOLS will be procured, 13 shipboard and 20 shore-based systems. Exact delivery dates and locations are not known at this time, but will be incorporated in future NTSP updates. The delivery schedule is planned as follows:

- Third quarter FY00 - Five shipboard
- Third quarter FY01 - Eight shipboard and seven shore-based systems
- Third quarter FY02 - Seven shore-based systems

d. Integrated Launch and Recovery Television Surveillance System. Currently the ILARTS is installed on all commissioned CVs and CVNs.

e. Landing Signal Officer Heads Up Display MK-1 MOD 0. Currently the LSO HUD is installed on all commissioned CVs and CVNs.

f. Long Range Line-Up System. Exact delivery dates and locations are not known at this time, but will be incorporated in future NTSP updates. LRLS delivery schedule is anticipated as follows:

- First quarter FY00 – Four shore-based systems
- Third quarter FY00 – Seven shipboard systems
- Second quarter FY01 – Six shipboard and six shore based systems

g. Manually Operated Visual Landing Aid System MK-1 MOD 2. Currently the MOVLAS is installed on all commissioned CVs and CVNs.

h. Virtual Imaging Systems For Approach and Landing. Installation and delivery schedules are not available at this time. Once this information becomes available it will be incorporated in future NTSP updates.

i. Wind Measuring Indicating System. Currently the WMIS Type F is installed on all commissioned CVs and CVNs.

2. Ready For Operational Use Schedule. All VLA systems are Ready For Operational Use (RFOU) upon installation, check out, and certification.

3. Time Required to Install at Operational Sites

a. Flight Deck Centerline Light Sequence Flasher System. The time required to install Flight Deck Centerline LSFS is three months.

b. Fresnel Lens Optical Landing System MK-6 MOD 3. All FLOLS Service Changes are incorporated.

c. Improved Fresnel Lens Optical Landing System MK-13 MOD 0. The time required to install IFLOLS is three weeks.

d. Integrated Launch and Recovery Television Surveillance System. The time required to install ILARTS is three months.

e. LSO HUD, MK-1 MOD 0. The installation time for the LSO HUD is three months.

f. LRLS. There will be an estimated one-month installation for the LRLS.

g. Manually Operated Visual Landing Aid System MK-1 MOD 2. The time required to install the wiring and mounts for the MOVLAS is two months. The MOVLAS is setup on an as needed basis in less than five minutes.

h. Virtual Imaging Systems For Approach and Landing. Time required to install at operational sites information is not available at this time. This information will be incorporated into future NTSP updates once it becomes available.

i. Wind Measuring Indicating System. The time required to install WMIS is three months.

4. Foreign Military Sales and Other Source Delivery Schedule. None of the nine systems contained in this NTSP are planned for foreign military sales at this time.

5. Training Device and Technical Training Equipment Delivery Schedule

a. Flight Deck Centerline Light Sequence Flasher System. There are no TDs or TTE for the Flight Deck Centerline LSFS.

b. Fresnel Lens Optical Landing System MK-6 MOD 3. Delivery of TTE for FLOLS MK-6 MOD 3 maintenance courses was completed in July 1985. See element IV.A.1 for a list of specific equipment. No TDs are required.

c. Improved Fresnel Lens Optical Landing System MK-13 MOD 0. Delivery of TTE for IFLOLS is third quarter FY00. No TDs are required.

d. Integrated Launch and Recovery Television Surveillance System. TTE was delivered in the 1980s as Service Changes were installed. No TDs are required.

e. Landing Signal Officer Heads Up Display MK-1 MOD 0. TTE was delivered in July 1985. No TDs are required.

f. Long Range Line-Up System. The plan is to provide a fully operational LRLS to the NATTC Lakehurst in July 2000 for use as an operation and maintenance trainer. Landing flight simulators at the LSO Schools require modification to present the LRLS display by June 2000. No TDs are required.

g. Manually Operated Visual Landing Aid System MK-1 MOD 2. TTE and TDs are in place.

h. Virtual Imaging Systems For Approach and Landing. TBD. Once TRPPM information becomes available, it will be incorporated into future NTSP updates.

i. Wind Measuring Indicating System. PMA205-3B2 and PMA251 are currently seeking funding for two shore-based WMISs to be delivered, one each, to FTC San Diego and FTC Norfolk.

L. GOVERNMENT FURNISHED EQUIPMENT AND CONTRACTOR FURNISHED EQUIPMENT TRAINING REQUIREMENTS. NA

M. RELATED NTSPs AND OTHER APPLICABLE DOCUMENTS. The following are documents that affect, are related to, or were used to develop this NTSP.

DOCUMENT OR NTSP TITLE	DOCUMENT OR NTSP NUMBER	PDA CODE	STATUS
LSO-HUD Console System MK-1 MOD 0 NTP	A-50-8009/A	PMA205-3C10	Approved Jan 81
Integrated Launch and Recovery Television Surveillance System (ILARTS) NTP	A-50-8401/A	PMA251	Approved Aug 84
Integrated Launch and Recovery Television Surveillance System (ILARTS) Operational Logistics Support Plan (OLSP)	NAEC 91-8060	PMA251	Approved Sep 84
Landing Signal Officer Heads Up Display (LSO HUD) MK-1 MOD 0 Operational Logistics Support Plan (OLSP)	NAEC 91-8026	PMA251	Approved Nov 84
Fresnel Lens Optical Landing System (FLOLS) MK-6 MOD 3 NTP	A-50-8409A/D	PMA205-3C4	Draft Jan 85
Maintenance Plan	SSIED MP No. 001-87	NAWC AD	Approved Oct 87
AN/SPN-46, Automatic Carrier Landing System (ACLS) NTP	E-50-8206D/A	PME120-2	Approved Sep 90
Landing Signal Officer (LSO) Training System NTP	A-50-8418A/A	PMA205-3H	Approved Nov 91
Amphibious Assault Ship Visual Landing Aid Systems NTP	A-50-9203/A	PMA261	Approved Dec 93
Air Capable Ships Visual Landing Aids (VLA) NTP	A-50-9205/A	PMA261	Approved Dec 93
Quality Assurance/Maintenance Program for Aircraft Launch and Recovery Equipment (ALRE) NTP	A-50-8509C/D	PMA251	Draft Jan 95
Training Project Plan	1500T23313/400		Approved Aug 96

PART II - BILLET AND PERSONNEL REQUIREMENTS

The following elements are not affected by the Aircraft Carrier Visual Landing Aid Systems and, therefore, are not included in Part II of this NTSP:

II.A. Billet Requirements

II.A.2.b. Billets to be Deleted in Operational and Fleet Support Activities

II.A.2.c. Total Billets to be Deleted in Operational and Fleet Support Activities

PART II - BILLET AND PERSONNEL REQUIREMENTS

II.A. BILLET REQUIREMENTS

II.A.1.a. OPERATIONAL AND FLEET SUPPORT ACTIVITY ACTIVATION SCHEDULE

SOURCE: NAWCADLKE

DATE: 9/98

ACTIVITY, UIC		PFYs	CFY99	FY00	FY01	FY02	FY03
OPERATIONAL ACTIVITY		NAVY					
CV-63 Kitty Hawk	03363	1	0	0	0	0	0
CV-64 Constellation	03364	1	0	0	0	0	0
CVN-65 Enterprise	03365	1	0	0	0	0	0
CV-67 Kennedy	03367	1	0	0	0	0	0
CVN-68 Nimitz	03368	1	0	0	0	0	0
CVN-69 Eisenhower	03369	1	0	0	0	0	0
CVN-70 Vinson	20993	1	0	0	0	0	0
CVN-71 Roosevelt	21247	1	0	0	0	0	0
CVN-72 Lincoln	21297	1	0	0	0	0	0
CVN-73 Washington	21412	1	0	0	0	0	0
CVN-74 Stennis	21847	1	0	0	0	0	0
CVN-75 Truman	21853	1	0	0	0	0	0
TOTAL:		12	0	0	0	0	0

Note 1: This Activation Schedule is used to establish billets for the Aircraft Carrier Visual Landing Aid System only.

Note 2: When the manpower data becomes available, CVN-76 Reagan will be added to this list in future updates to this NTSP.

II.A.1.b. BILLETS REQUIRED FOR OPERATIONAL AND FLEET SUPPORT ACTIVITIES

ACTIVITY, UIC, PHASING INCREMENT	BILLETS		DESIG RATING	PNEC/SNEC PMOS/SMOS
	OFF	ENL		
CV-62 Independence * 03362				
ACDU	0	5	IC	4743
	0	4	IC	4745
	0	3	ABE	7006
ACTIVITY TOTAL:	0	12		
CV-63 Kitty Hawk 03363				
ACDU	0	3	IC	4743
	0	5	IC	4745
	0	3	ABE	7006
ACTIVITY TOTAL:	0	11		
CV-64 Constellation 03364				
ACDU	0	5	IC	4743
	0	4	IC	4745
	0	5	ABE	7006
ACTIVITY TOTAL:	0	14		
CVN-65 Enterprise 03365				
ACDU	0	4	IC	4743
	0	4	IC	4745
	0	4	ABE	7006
ACTIVITY TOTAL:	0	12		
CV-67 Kennedy 03367				
ACDU	0	2	IC	4743
SELRES	0	1	IC	4743
ACDU	0	4	IC	4745
	0	4	ABE	7006
ACTIVITY TOTAL:	0	11		
CVN-68 Nimitz 03368				
ACDU	0	5	IC	4743
	0	4	IC	4745
	0	4	ABE	7006
ACTIVITY TOTAL:	0	13		
CVN-69 Eisenhower 03369				
ACDU	0	5	IC	4743
	0	4	IC	4745
	0	4	ABE	7006
ACTIVITY TOTAL:	0	13		

* **Note:** Per NAVADMIN 124-97, CV-62 decommissioned Sep 98. TFMMS does not yet show an elimination of manpower.

I.A.1.b. BILLETS REQUIRED FOR OPERATIONAL AND FLEET SUPPORT ACTIVITIES

ACTIVITY, UIC, PHASING INCREMENT		BILLETS OFF ENL		DESIG RATING	PNEC/SNEC PMOS/SMOS
CVN-70 Vinson ACDU	20993	0	3	IC	4743
		0	4	IC	4745
		0	4	ABE	7006
		0	11		
ACTIVITY TOTAL:					
CVN-71 Roosevelt ACDU SELRES ACDU	21247	0	3	IC	4743
		0	1	IC	4745
		0	3	IC	4745
		0	4	ABE	7006
ACTIVITY TOTAL:		0	11		
CVN-72 Lincoln ACDU	21297	0	4	IC	4743
		0	4	IC	4745
		0	4	ABE	7006
		0	12		
ACTIVITY TOTAL:					
CVN-73 Washington ACDU SELRES ACDU	21412	0	4	IC	4743
		0	1	IC	4745
		0	3	IC	4745
		0	3	ABE	7006
ACTIVITY TOTAL:		0	11		
CVN-74 Stennis ACDU	21847	0	3	IC	4743
		0	3	IC	4745
		0	4	ABE	7006
		0	10		
ACTIVITY TOTAL:					
CVN-75 Truman ACDU	21853	0	3	IC	4743
		0	3	IC	4745
		0	6	ABE	7006
		0	12		
ACTIVITY TOTAL:					

Note: When the manpower data becomes available, CVN-76 Reagan will be added to this list in future updates to this NTSP

II.A.1.c. TOTAL BILLETS REQUIRED FOR OPERATIONAL AND FLEET SUPPORT ACTIVITIES

DESIG RATING	PNEC/SNEC PMOS/SMOS	PFYs		CFY99		FY00		FY01		FY02		FY03	
		OFF	ENL	OFF	ENL	OFF	ENL	OFF	ENL	OFF	ENL	OFF	ENL
OPERATIONAL ACTIVITY		- ACDU											
IC	4743	0	49	0	49	0	49	0	49	0	49	0	49
OPERATIONAL ACTIVITY		- SELRES											
IC	4743	0	1	0	1	0	1	0	1	0	1	0	1
OPERATIONAL ACTIVITY		- ACDU											
IC	4745	0	49	0	49	0	49	0	49	0	49	0	49
OPERATIONAL ACTIVITY		- SELRES											
IC	4745	0	2	0	2	0	2	0	2	0	2	0	2
OPERATIONAL ACTIVITY		- ACDU											
ABE	7006	0	52	0	52	0	52	0	52	0	52	0	52
SUMMARY TOTAL													
OPERATIONAL ACTIVITY		- ACDU											
		0	150	0	150	0	150	0	150	0	150	0	150
OPERATIONAL ACTIVITY		- SELRES											
		0	3	0	3	0	3	0	3	0	3	0	3
GRAND TOTAL													
		- ACDU											
		0	150	0	150	0	150	0	150	0	150	0	150
		- SELRES											
		0	3	0	3	0	3	0	3	0	3	0	3

II.A.2.a. OPERATIONAL AND FLEET SUPPORT ACTIVITY DEACTIVATION SCHEDULE

SOURCE: NAVADMIN 124-97

DATE: 16 September 1997

ACTIVITY, UIC	PFYs	CFY99	FY00	FY01	FY02	FY03
OPERATIONAL ACTIVITY	NAVY					
CV-62 Independence 03362	1	0	0	0	0	0
TOTAL:	1	0	0	0	0	0

Note: Per NAVADMIN 124-97, CV-62 Independence was decommissioned in FY98. TFMMS manpower documentation does not show an elimination of manpower at this time.

II.A.3. TRAINING ACTIVITIES INSTRUCTOR AND SUPPORT BILLET REQUIREMENTS

INSTRUCTOR BILLETS

TRAINING ACTIVITY, LOCATION, UIC: SSC, Great Lakes, Illinois, 0580A

DESIG RATING	PNEC/SNEC PMOS/SMOS	PFYs		CFY99		FY00		FY01		FY02		FY03	
		OFF	ENL	OFF	ENL	OFF	ENL	OFF	ENL	OFF	ENL	OFF	ENL
ACDU IC	4743			0	3	0	1	0	1	0	1	0	1

TRAINING ACTIVITY, LOCATION, UIC: NATTC DET, Lakehurst, New Jersey, 63094

DESIG RATING	PNEC/SNEC PMOS/SMOS	PFYs		CFY99		FY00		FY01		FY02		FY03	
		OFF	ENL	OFF	ENL	OFF	ENL	OFF	ENL	OFF	ENL	OFF	ENL
ACDU IC	4745			0	3	0	3	0	3	0	3	0	3

TRAINING ACTIVITY, LOCATION, UIC: NATTC DET, Lakehurst, New Jersey, 68335

DESIG RATING	PNEC/SNEC PMOS/SMOS	PFYs		CFY99		FY00		FY01		FY02		FY03	
		OFF	ENL	OFF	ENL	OFF	ENL	OFF	ENL	OFF	ENL	OFF	ENL
ACDU ABE	7006			0	3	0	3	0	3	0	3	0	3

II.A.4. CHARGEABLE STUDENT BILLET REQUIREMENTS

ACTIVITY, LOCATION, UIC	USN/ USMC	PFYs		CFY99		FY00		FY01		FY02		FY03	
		OFF	ENL	OFF	ENL	OFF	ENL	OFF	ENL	OFF	ENL	OFF	ENL
SSC, Great Lakes, Illinois, 30626													
	Navy	0	4.8	0	4.8	0	4.8	0	4.8	0	4.8	0	4.8
NATTC DET, Lakehurst, New Jersey, 30460													
	Navy	0	7.1	0	7.1	0	7.1	0	7.1	0	7.1	0	7.1
SUMMARY TOTAL													
	Navy	0	11.9	0	11.9	0	11.9	0	11.9	0	11.9	0	11.9
GRAND TOTAL													
		0	11.9	0	11.9	0	11.9	0	11.9	0	11.9	0	11.9

II.A.5. ANNUAL INCREMENTAL AND CUMULATIVE BILLETS

DESIG RATING	PMOS/SMOS PNEC/SNEC	BILLET BASE	CFY99 +/- CUM	FY00 +/- CUM	FY01 +/- CUM	FY02 +/- CUM	FY03 +/- CUM
a. ENLISTED - USN							
Operational Billets ACDU							
IC	4743	49	0 49	0 49	0 49	0 49	0 49
IC	4745	49	0 49	0 49	0 49	0 49	0 49
ABE	7006	52	0 52	0 52	0 52	0 52	0 52
Instructor and Support (Staff) Billets ACDU							
IC	4743	1	0 1	0 1	0 1	0 1	0 1
IC	4745	3	0 3	0 3	0 3	0 3	0 3
ABE	7006	3	0 3	0 3	0 3	0 3	0 3
Chargeable Student Billets ACDU							
		12	0 12	0 12	0 12	0 12	0 12
TOTAL USN ENLISTED BILLETS							
Operational		150	0 150	0 150	0 150	0 150	0 150
Staff		7	0 7	0 7	0 7	0 7	0 7
SELRES		3	0 3	0 3	0 3	0 3	0 3

II.B. PERSONNEL REQUIREMENTS

II.B.1. ANNUAL TRAINING INPUT REQUIREMENTS

CIN, COURSE TITLE: A-191-0011, Integrated Launch and Recovery Television Surveillance System Maintenance

COURSE LENGTH: 18.0 Weeks

TOUR LENGTH: Navy: 36

ATTRITION FACTOR: Navy: 10 %

BACKOUT FACTOR: 0.30

TRAINING ACTIVITY	SOURCE	ACDU/TAR SELRES	CFY99 OFF ENL	FY00 OFF ENL	FY01 OFF ENL	FY02 OFF ENL	FY03 OFF ENL
SSC, Great Lakes							
	Navy	ACDU	0 18	0 18	0 18	0 18	0 18
		TOTAL:	0 18	0 18	0 18	0 18	0 18

ACTIVITY TOTAL:

SSC, Great Lakes			0 18	0 18	0 18	0 18	0 18
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CIN, COURSE TITLE: C-670-2010, Optical Landing Systems Maintenance

COURSE LENGTH: 10.0 Weeks

TOUR LENGTH: Navy: 36

ATTRITION FACTOR: Navy: 10 %

BACKOUT FACTOR: 0.20

TRAINING ACTIVITY	SOURCE	ACDU/TAR SELRES	CFY99 OFF ENL	FY00 OFF ENL	FY01 OFF ENL	FY02 OFF ENL	FY03 OFF ENL
NATTC DET Lakehurst							
	Navy	ACDU	0 18	0 18	0 18	0 18	0 18
	Navy	SELRES	0 0	0 0	0 1	0 0	0 0
		TOTAL:	0 18	0 18	0 19	0 18	0 18

CIN, COURSE TITLE: C-604-2028, Aircraft Launch and Recovery Equipment Maintenance Technician

COURSE LENGTH: 11.6 Weeks

TOUR LENGTH: Navy: 36

ATTRITION FACTOR: Navy: 10 %

BACKOUT FACTOR: 0.23

TRAINING ACTIVITY	SOURCE	ACDU/TAR SELRES	CFY99 OFF ENL	FY00 OFF ENL	FY01 OFF ENL	FY02 OFF ENL	FY03 OFF ENL
NATTC DET Lakehurst							
	Navy	ACDU	0 19	0 19	0 19	0 19	0 19
		TOTAL:	0 19	0 19	0 19	0 19	0 19

ACTIVITY TOTAL:

NATTC DET Lakehurst			0 37	0 37	0 38	0 37	0 37
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PART III - TRAINING REQUIREMENTS

The following elements are not affected by the Aircraft Carrier Visual Landing Aid System and, therefore, are not included in Part III of this NTSP:

III.A.2. Follow-on Training

III.A.2.b. Planned Courses

III.A.2.c. Unique Courses

III.A.3. Existing Training Phased Out

PART III - TRAINING REQUIREMENTS

III.A.1. INITIAL TRAINING REQUIREMENTS

COURSE TITLE: Improved Fresnel Lens Optical Landing System Initial Training
COURSE DEVELOPER: NAWCADLKE
COURSE INSTRUCTOR: NAWCADLKE
COURSE LENGTH: TBD

LOCATION, UIC	DATE BEGIN	STUDENTS			CIV	ACTIVITY	DESTINATION
		OFF	ENL				
NAWCADLKE	48558	TBD	0	TBD	TBD	INPUT	NATTC DET Lakehurst
			0	TBD	TBD	AOB	
			0	TBD	TBD	CHARGEABLE	

COURSE TITLE: Long Range Line-up System Initial Training Initial Training
COURSE DEVELOPER: Raytheon
COURSE INSTRUCTOR: Raytheon
COURSE LENGTH: TBD

LOCATION, UIC	DATE BEGIN	STUDENTS			CIV	ACTIVITY	DESTINATION
		OFF	ENL				
TBD	TBD		0	TBD	TBD	INPUT	NATTC DET Lakehurst
			0	TBD	TBD	AOB	
			0	TBD	TBD	CHARGEABLE	

Note: OPEVAL and TECHEVAL initial training has been completed for the Improved Fresnel Lens Optical Landing System and the Long Range Line-up System. Complete information on initial training for instructors will be included in future updates of this NTSP as that information becomes available. Information for the Virtual Imaging Systems for Approach and Landing will be included in further updates of this NTSP as that information becomes available.

III.A.2. FOLLOW-ON TRAINING

III.A.2.a. EXISTING COURSES

CIN, COURSE TITLE: A-191-0011, Integrated Launch and Recovery Television Surveillance System Maintenance

TRAINING ACTIVITY: SSC Great Lakes

LOCATION, UIC: Great Lakes, 30626

SOURCE: Navy **STUDENT CATEGORY:** ACDU

CFY99		FY00		FY01		FY02		FY03		
OFF	ENL	OFF	ENL	OFF	ENL	OFF	ENL	OFF	ENL	
0	18	0	18	0	18	0	18	0	18	ATIR
0	16	0	16	0	16	0	16	0	16	Output
0	4.8	0	4.8	0	4.8	0	4.8	0	4.8	AOB
0	4.8	0	4.8	0	4.8	0	4.8	0	4.8	Chargeable

CIN, COURSE TITLE: C-670-2010, Optical Landing System Maintenance

TRAINING ACTIVITY: NATTC DET Lakehurst

LOCATION, UIC: NAWCADLKE, 30460

SOURCE: Navy **STUDENT CATEGORY:** ACDU

CFY99		FY00		FY01		FY02		FY03		
OFF	ENL	OFF	ENL	OFF	ENL	OFF	ENL	OFF	ENL	
0	18	0	18	0	18	0	18	0	18	ATIR
0	16	0	16	0	16	0	16	0	16	Output
0	3.2	0	3.2	0	3.2	0	3.2	0	3.2	AOB
0	3.2	0	3.2	0	3.2	0	3.2	0	3.2	Chargeable

CIN, COURSE TITLE: C-670-2010, Optical Landing System Maintenance

TRAINING ACTIVITY: NATTC DET Lakehurst

LOCATION, UIC: NAWCADLKE, 30460

SOURCE: Navy **STUDENT CATEGORY:** SELRES

CFY99		FY00		FY01		FY02		FY03		
OFF	ENL	OFF	ENL	OFF	ENL	OFF	ENL	OFF	ENL	
0	0	0	0	0	1	0	0	0	0	ATIR
0	0	0	0	0	1	0	0	0	0	Output
0	0	0	0	0	0.2	0	0	0	0	AOB
0	0	0	0	0	0	0	0	0	0	Chargeable

III.A.2. FOLLOW-ON TRAINING

III.A.2.a. EXISTING COURSES

CIN, COURSE TITLE: C-604-2028, Aircraft Launch and Recovery Equipment Maintenance Technician

TRAINING ACTIVITY: NATTC DET Lakehurst

LOCATION, UIC: NAWCADLKE, 30460

SOURCE: Navy **STUDENT CATEGORY:** ACDU

CFY99		FY00		FY01		FY02		FY03		
OFF	ENL	OFF	ENL	OFF	ENL	OFF	ENL	OFF	ENL	
0	19	0	19	0	19	0	19	0	19	ATIR
0	17	0	17	0	17	0	17	0	17	Output
0	3.9	0	3.9	0	3.9	0	3.9	0	3.9	AOB
0	3.9	0	3.9	0	3.9	0	3.9	0	3.9	Chargeable

PART IV - TRAINING LOGISTICS SUPPORT REQUIREMENTS

The following elements are not affected by the Aircraft Carrier Visual Landing Aid Systems and, therefore, are not included in Part IV of this NTSP:

IV.C. Facility Requirements

IV.C.1. Facility Requirements Summary (Space/Support) by Activity

IV.C.2. Facility Requirements Detailed by Activity and Course

IV.C.3. Facility Project Summary by Program

PART IV - TRAINING LOGISTICS SUPPORT REQUIREMENTS

IV.A. TRAINING HARDWARE

IV.A.1. TTE / GPTE / SPTE / ST / GPETE / SPETE

CIN, COURSE TITLE: C-670-2010, Optical Landing Systems Maintenance

TRAINING ACTIVITY: NATTC DET Lakehurst

LOCATION, UIC: NAWCADLKE, 30460

ITEM NUMBER	EQUIPMENT	TYPE OR RANGE OF REPAIR PARTS	QTY REQUIRED	DATE REQUIRED	GFE CFE	STATUS
GPTE						
001	FLOLS Cell Tester, NAEC 61828-1 Rev. C Assembly		1	4/4/90	GFE	On board
002	Multimeters, Simpson 260IV or equivalent		2	4/4/90	GFE	On board
003	Weston 2261 Dial Thermometer or equivalent		1	4/4/90	GFE	On board
004	Oscilloscope, Tektronix Model 434		1	4/4/90	GFE	On board
005	Fluke Model 8012A True RMS DVM		1	4/4/90	GFE	On board
006	Fluke 801-600 Current Probe		1	4/4/90	GFE	On board
007	Gyro breakout box 619603-1		1	4/4/90	GFE	On board
008	Cell tester 618281-1		1	4/4/90	GFE	On board
009	De-soldering Station Model PRC.150A with zero power switching		1	4/4/90	GFE	On board
010	Oscilloscope, F475TA		1	4/4/90	GFE	On board
011	Headset, Chest Set, Electrical, Type H-200/U, Sound-Powered		1	4/4/90	GFE	On board
012	Hydraulic Filtration Unit, HFB-2K3H-1		1	4/4/90	GFE	On board
SPTE						
013	Card puller, 41367-1		1	4/4/90	GFE	On board
014	Card puller, 424794-1		1	4/4/90	GFE	On board
015	Sighting pole, 616472-1		1	4/4/90	GFE	On board
016	Test simulator, NAEC A/E-24-145		1	4/4/90	GFE	On board
017	Test set, A/E-24T-145		1	4/4/90	GFE	On board
018	Test cables, 621110-1 through 7		1	4/4/90	GFE	On board
019	Blocking stand, 621559-1		1	4/4/90	GFE	On board

CIN, COURSE TITLE: A-191-0011, Integrated Launch And Recovery Television Surveillance System Maintenance

TRAINING ACTIVITY: SSC Great Lakes

LOCATION, UIC: Great Lakes, 43308

ITEM NUMBER	EQUIPMENT	TYPE OR RANGE OF REPAIR PARTS	QTY REQUIRED	DATE REQUIRED	GFE CFE	STATUS
SPTE						
020	Oscilloscope Tektronics Model 2246		13	11/5/94	GFE	On board
021	Digital Multimeter Fluke Model 8000A		5	11/5/94	GFE	On board
022	Tool Kit 50633, 40F60047900		1	11/5/94	GFE	On board
023	SVHS video cassettes 55151, ST-1268Q		20	11/5/94	GFE	Pending
023	ECSS calibration pole 80020, 516602-1		1	1/5/98	GFE	Pending
024	Extender board (Data Generator 622902-X) 80020, 623818-1		1	11/5/94	GFE	On board
025	Extender board (for Interface enclosure 627310-1) 80020, 522705-1		1	1/5/98	GFE	Pending
026	Extender board (for Cohu DM series monitors) 80020, 523651-1		5	11/5/94	GFE	On board

IV.A.1. TTE / GPTE / SPTE / ST / GPETE / SPETE

CIN, COURSE TITLE: C-604-2028, Aircraft Launch and Recovery Equipment Maintenance Technician

TRAINING ACTIVITY: NATTC DET Lakehurst

LOCATION, UIC: NAWCADLKE, 30460

ITEM NUMBER	EQUIPMENT	TYPE OR RANGE OF REPAIR PARTS	QTY REQUIRED	DATE REQUIRED	GFE CFE	STATUS
GPTE						
002	Multimeters, Simpson 260IV or equivalent		2	4/4/90	GFE	On board
010	Oscilloscope, F475TA		1	4/4/90	GFE	On board
011	Headset, Chest Set, Electrical, Type H-200/U, Sound-Powered		1	4/4/90	GFE	On board
012	Hydraulic Filtration Unit, HFB-2K3H-1		1	4/4/90	GFE	On board
SPTE						
017	Test Set, A/E-24T-145		1	4/4/90	GFE	On board
018	Test Cables, 621110-1 through 7		1	4/4/90	GFE	On board
019	Blocking Stand, 621559-1		1	4/4/90	GFE	On board

IV.A.2. TRAINING DEVICES

DEVICE: LSO Trainer
DESCRIPTION: 220-degree screen displaying approximately five different types of aircraft in day or night variable weather conditions.
MANUFACTURER: CONTRAVES
CONTRACT NUMBER: N61339-85-C-0056
TEE STATUS: NA

TRAINING ACTIVITY: LSO School, NAS Oceana
LOCATION, UIC : Virginia Beach 68788

QTY REQD	DATE REQD	RFT DATE	STATUS	COURSES SUPPORTED
1	1/3/96	2/3/96	Onboard	D-2G-0001 D-2G-0002 D-2G-0003

IV.B.1. TRAINING SERVICES

COURSE/TYPE OF TRAINING	SCHOOL LOCATION/UIC	NO. OF PERSONNEL	MAN WEEKS REQUIRED	DATE BEGIN
Improved Fresnel Lens Optical Landing System Initial Training	NATTC DET Lakehurst NAWCADLKE 48558	TBD	TBD	TBD
Long Range Line-up System Initial Training	NATTC DET Lakehurst NAWCADLKE 48558	TBD	TBD	TBD

Note: OPEVAL and TECHEVAL initial training has been completed for the Improved Fresnel Lens Optical Landing System and the Long Range Line-up System. Complete information on initial training for instructors will be included in further updates of this NTSP as that information becomes available. Information for the Virtual Imaging Systems for Approach and Landing will be included in further updates of this NTSP as that information becomes available.

IV.B.2. CURRICULA MATERIALS AND TRAINING AIDS

CIN, COURSE TITLE: C-670-2010, Optical Landing Systems Maintenance

TRAINING ACTIVITY: NATTC DET Lakehurst

LOCATION, UIC: NAWCADLKE, 30460

TYPES OF MATERIAL OR AID	QTY REQD	DATE REQD	STATUS
Instructor Guide	3	3/3/77	On board
Student Guide	50	3/3/77	On board
Student Evaluations	50	3/3/77	On board
Student Test	50	3/3/77	On board
Wall Charts	6	3/3/77	On board
Transparencies	9	3/3/77	On board

CIN, COURSE TITLE: A-191-0011, Integrated Launch And Recovery Television Surveillance System Maintenance Technician

TRAINING ACTIVITY: SSC Great Lakes

LOCATION, UIC: Great Lakes, 43308

TYPES OF MATERIAL OR AID	QTY REQD	DATE REQD	STATUS
Instructor Guide	3	2/10/88	On board
Student Guide	50	2/10/88	On board
Student Evaluations	50	2/10/88	On board
Student Test	50	2/10/88	On board
Wall Charts	6	2/10/88	On board
Transparencies	9	2/10/88	On board

CIN, COURSE TITLE: C-604-2028, Aircraft Launch and Recovery Equipment Maintenance Technician

TRAINING ACTIVITY: NATTC DET Lakehurst

LOCATION, UIC: NAWCADLKE, 30460

TYPES OF MATERIAL OR AID	QTY REQD	DATE REQD	STATUS
Instructor Guide	3	3/15/70	On board
Student Guide	50	3/15/70	On board
Student Evaluations	50	3/15/70	On board
Student Test	50	3/15/70	On board
Wall Charts	6	3/15/70	On board
Transparencies	9	3/15/70	On board

IV.B.3. TECHNICAL MANUALS

CIN, COURSE TITLE: OJT, Flight Deck Centerline Light Sequence Flasher System

TRAINING ACTIVITY: CVs and CVNs

LOCATION, UIC: CVs and CVNs

TECHNICAL MANUAL TITLE, NUMBER	MEDIUM	QTY REQD	DATE REQD	STATUS
Shipboard Operations and Maintenance Manual with Illustrated Parts Breakdown for Flight Deck Centerline LSFS NAVAIR 51-50ABA-5	Hard copy	26		On board

CIN, COURSE TITLE: C-670-2010, Optical Landing Systems Maintenance

TRAINING ACTIVITY: NATTC DET Lakehurst

LOCATION, UIC: NAWCADLKE, 30460

TECHNICAL MANUAL TITLE, NUMBER	MEDIUM	QTY REQD	DATE REQD	STATUS
Installation, Service, Operation, and Maintenance and 10.1 (Vol. 1 and 2) Instruction Manuals for Fresnel Lens Optical Landing System (FLOLS) MK-6 MOD 3 NAVAIR 51-40ABA-10	Hard copy	4		On board
Illustrated Parts Breakdown (IPB) for FLOLS MK-6 MOD 3 NAVAIR 51-40BA-11	Hard copy	4		On board
Maintenance Requirement Cards (MRC) and FLOLS MK-6 MOD 3 Maintenance Index Page (MIP) 34922-RSL-49	Hard copy	4		On board
Improved Fresnel Lens Optical Landing System (IFLOLS) Operation and Maintenance Manual with Illustrated Parts Breakdown NAVAIR 51-40ABA-21	Hard copy	4	3/3/01	Pending
Installation, Operation and Maintenance Instruction; Landing Signal Officer Heads-Up display (LSO HUD) Console System MK-1 MOD 0 and HUD Console Test Simulator A/E-24T-45 NAVAIR 51-60-9	Hard copy	4		On board
Illustrated Parts Breakdown; LSO HUD Console System MK-1 MOD 0 and HUD Console Test Simulator A/E-24T-45 NAVAIR 51-60-9.1	Hard copy	4		On board
Long Range Line-UP (LRLS) Operation and Maintenance Manual with Illustrated Parts Breakdown NAVAIR 51-ABA-6	Hard copy	4	6/3/99	Pending
Installation, Operation and Maintenance Instruction with Illustrated Parts Breakdown; Manually Operated Visual Landing Aid System (MOVLAS) MK-1 MOD 2 NAVAIR 51-40-ACA-2	Hard copy	4		On board

IV.B.3. TECHNICAL MANUALS

CIN, COURSE TITLE: A-191-0011, Integrated Launch And Recovery Television Surveillance System Maintenance

TRAINING ACTIVITY: SSC Great Lakes

LOCATION, UIC: Great Lakes, 43308

TECHNICAL MANUAL TITLE, NUMBER	MEDIUM	QTY REQD	DATE REQD	STATUS
Installation, Operation and Maintenance Instruction with Illustrated Parts Breakdown for the Integrated Launch and Recovery Television System (ILARTS) Organizational NAVAIR 51-60-8-1	Hard copy	4		On board
Installation, Operation and Maintenance Instructions with Illustrated Parts Breakdown for the ILARTS Low Light Level Television System (Organizational) NAVAIR 51-60-8-2	Hard copy	4		On board
Installation, Operation and Maintenance Instructions with Illustrated Parts Breakdown for the ILARTS Console Control (Organizational) NAVAIR 51-60-8-3	Hard copy	4		On board
Operation and Maintenance Instructions with Illustrated Parts Breakdown for the ILARTS Data Generator Assembly (Organizational and Intermediate) NAVAIR 51-60-8-4	Hard copy	4		On board
Operation and Maintenance Instructions for ILARTS DM Series Monochrome Television Monitors NAVAIR 51-60-8-5	Hard copy	4		On board
Intermediate Maintenance Instructions for Airborne Video Tape Recorder (AVTR) System, Recorder / Reproducer Audio Visual RD-453/GQX NAVAIR 51-60-8-7	Hard copy	4		On board
Intermediate Maintenance Instructions for ILARTS Video Cassette Recorder System Recorder / Reproducer Audio Visual RD-504/SSQ NAVAIR 51-60-8-7.1	Hard copy	4		On board
Airborne Video Tape Recorder Overhaul Instructions NAVAIR 51-60-8-8	Hard copy	4		On board
Video Cassette Recorder System (Navy Supplement) NAVAIR 51-60-8-8.1	Hard copy	4		On board
Instrument Calibration Procedures NAVAIR 51-60-8-9	Hard copy	4		On board
Illustrated Parts Breakdown for ILARTS Video Cassette Recorder / Reproducer Audio Visual RD-504/SSQ (Navy Supplement) NAVAIR 51-60-8-9,1	Hard copy	4		On board

IV.B.3. TECHNICAL MANUALS

CIN, COURSE TITLE: A-191-0011, Integrated Launch And Recovery Television Surveillance System Maintenance
TRAINING ACTIVITY: SSC Great Lakes
LOCATION, UIC: Great Lakes, 43308

TECHNICAL MANUAL TITLE, NUMBER	MEDIUM	QTY REQD	DATE REQD	STATUS
Operation and Maintenance Instructions for NTSC Color Sync and Test Signal Generator Model 1470 Mod G3J, NAVAIR 51-60-8-11	Hard copy	4		On board
Operation and Maintenance Instructions for TV Waveform Monitor Model 528A NAVAIR 51-60-8-12	Hard copy	4		On board
Operation and Maintenance Instructions and Illustrated Parts Breakdown for ILARTS Catapult Surveillance System NAVAIR 51-60-8-13	Hard copy	4		On board

CIN, COURSE TITLE: D-2G-0001, Intermediate Fighter Ground Training
TRAINING ACTIVITY: LSO School, NAS Oceana
LOCATION, UIC: NAS Oceana, 60191

TECHNICAL MANUAL TITLE, NUMBER	MEDIUM	QTY REQD	DATE REQD	STATUS
Installation, Service, Operation, and Maintenance And 10.1 (Vol. 1 and 2) Instruction Manuals for Fresnel Lens Optical Landing System (FLOLS) MK-6 MOD 3 NAVAIR 51-40ABA-10	Hard copy	10		On board
Illustrated Parts Breakdown (IPB) for FLOLS MK-6 MOD 3 NAVAIR 51-40BA-11	Hard copy	10		On board
Maintenance Requirement Cards (MRC) and FLOLS MK-6 MOD 3 Maintenance Index Page (MIP) 34922-RSL-49	Hard copy	1		On board
Improved Fresnel Lens Optical Landing System (IFLOLS) Operation and Maintenance Manual with Illustrated Parts Breakdown NAVAIR 51-40ABA-21	Hard copy	10	3/3/01	Pending
Installation, Operation and Maintenance Instruction; Landing Signal Officer Heads-Up Display (LSO HUD) Console System MK-1 MOD 0 and HUD Console Test Simulator A/E-24T-45 NAVAIR 51-60-9	Hard copy	10		On board
Illustrated Parts Breakdown; LSO HUD Console System MK-1 MOD 0 and HUD Console Test Simulator A/E-24T-45 NAVAIR 51-60-9.1	Hard copy	10		On board

IV.B.3. TECHNICAL MANUALS

CIN, COURSE TITLE: D-2G-0001, Intermediate Fighter Ground Training
TRAINING ACTIVITY: LSO School, NAS Oceana
LOCATION, UIC: NAS Oceana, 60191

TECHNICAL MANUAL TITLE, NUMBER	MEDIUM	QTY REQD	DATE REQD	STATUS
Long Range Line-UP (LRLS) Operation and Maintenance Manual with Illustrated Parts Breakdown NAVAIR 51-ABA-6	Hard copy	10	6/3/99	Pending
Installation, Operation and Maintenance Instruction with Illustrated Parts Breakdown; Manually Operated Visual Landing Aid System (MOVLAS) MK-1 MOD 2 NAVAIR 51-40-ACA-2	Hard copy	10		On board
NATOPS, OPNAV3710.7P	Hard copy	10		On board
LSO NATOPS, NA00-801-104	Hard copy	10		On board
CV NATOPS, NA 00-804-105	Hard copy	10		On board

CIN, COURSE TITLE: D-2G-0002, Advanced Fighter Ground Training
TRAINING ACTIVITY: LSO School, NAS Oceana
LOCATION, UIC: NAS Oceana, 60191

TECHNICAL MANUAL TITLE, NUMBER	MEDIUM	QTY REQD	DATE REQD	STATUS
Installation, Service, Operation, and Maintenance and 10.1 (Vol. 1 and 2) Instruction Manuals for Fresnel Lens Optical Landing System (FLOLS) MK-6 MOD 3 NAVAIR 51-40ABA-10	Hard copy	10		On board
Illustrated Parts Breakdown (IPB) for FLOLS MK-6 MOD 3 NAVAIR 51-40BA-11	Hard copy	10		On board
Maintenance Requirement Cards (MRC) and FLOLS MK-6 MOD 3 Maintenance Index Page (MIP) 34922-RSL-49	Hard copy	1		On board
Improved Fresnel Lens Optical Landing System (IFLOLS) Operation and Maintenance Manual with Illustrated Parts Breakdown NAVAIR 51-40ABA-21	Hard copy	10	3/3/01	Pending
Installation, Operation and Maintenance Instruction; Landing Signal Officer Heads-Up Display (LSO HUD) Console System MK-1 MOD 0 and HUD Console Test Simulator A/E-24T-45 NAVAIR 51-60-9	Hard copy	10		On board

IV.B.3. TECHNICAL MANUALS

CIN, COURSE TITLE: D-2G-0002, Advanced Fighter Ground Training
TRAINING ACTIVITY: LSO School, NAS Oceana
LOCATION, UIC: NAS Oceana, 60191

TECHNICAL MANUAL TITLE, NUMBER	MEDIUM	QTY REQD	DATE REQD	STATUS
Illustrated Parts Breakdown; LSO HUD Console System MK-1 MOD 0 and HUD Console Test Simulator A/E-24T-45 NAVAIR 51-60-9.1	Hard copy	10		On board
Long Range Line-UP (LRLS) Operation and Maintenance Manual with Illustrated Parts Breakdown NAVAIR 51-ABA-6	Hard copy	10	6/3/99	Pending
Installation, Operation and Maintenance Instruction with Illustrated Parts Breakdown; Manually Operated Visual Landing Aid System (MOVLAS) MK-1 MOD 2 NAVAIR 51-40-ACA-2	Hard copy	10		On board
NATOPS, OPNAV3710.7P	Hard copy	10		On board
LSO NATOPS, NA00-801-104	Hard copy	10		On board
CV NATOPS, NA 00-804-105	Hard copy	10		On board

CIN, COURSE TITLE: D-2G-0003, Fleet Replacement Squadron Training Completion
TRAINING ACTIVITY: LSO School, NAS Oceana
LOCATION, UIC: NAS Oceana, 60191

TECHNICAL MANUAL TITLE, NUMBER	MEDIUM	QTY REQD	DATE REQD	STATUS
Installation, Service, Operation, and Maintenance and 10.1 (Vol. 1 and 2) Instruction Manuals for Fresnel Lens Optical Landing System (FLOLS) MK-6 MOD 3 NAVAIR 51-40ABA-10	Hard copy	10		On board
Illustrated Parts Breakdown (IPB) for FLOLS MK-6 MOD 3 NAVAIR 51-40BA-11	Hard copy	10		On board
Maintenance Requirement Cards (MRC) and FLOLS MK-6 MOD 3 Maintenance Index Page (MIP) 34922-RSL-49	Hard copy	1		On board
Improved Fresnel Lens Optical Landing System (IFLOLS) Operation and Maintenance Manual with Illustrated Parts Breakdown NAVAIR 51-40ABA-21	Hard copy	10	3/3/01	Pending

IV.B.3. TECHNICAL MANUALS

CIN, COURSE TITLE: D-2G-0003, Fleet Replacement Squadron Training Completion

TRAINING ACTIVITY: LSO School, NAS Oceana

LOCATION, UIC: NAS Oceana, 60191

TECHNICAL MANUAL TITLE, NUMBER	MEDIUM	QTY REQD	DATE REQD	STATUS
Installation, Operation and Maintenance Instruction; Landing Signal Officer Heads-Up Display (LSO HUD) Console System MK-1 MOD 0 and HUD Console Test Simulator A/E-24T-45 NAVAIR 51-60-9	Hard copy	10		On board
Illustrated Parts Breakdown; LSO HUD Console System MK-1 MOD 0 and HUD Console Test Simulator A/E-24T-45 NAVAIR 51-60-9.1	Hard copy	10		On board
Long Range Line-UP (LRLS) Operation and Maintenance Manual with Illustrated Parts Breakdown NAVAIR 51-ABA-6	Hard copy	10	6/3/99	Pending
Installation, Operation and Maintenance Instruction with Illustrated Parts Breakdown; Manually Operated Visual Landing Aid System (MOVLAS) MK-1 MOD 2 NAVAIR 51-40-ACA-2	Hard copy	10		On board
NATOPS, OPNAV3710.7P	Hard copy	10		On board
LSO NATOPS, NA00-801-104	Hard copy	10		On board
CV NATOPS, NA 00-804-105	Hard copy	10		On board

CIN, COURSE TITLE: C-604-2028, Aircraft Launch and Recovery Equipment Maintenance Technician

TRAINING ACTIVITY: NATTC DET Lakehurst

LOCATION, UIC: NAWCADLKE, 30460

TECHNICAL MANUAL TITLE, NUMBER	MEDIUM	QTY REQD	DATE REQD	STATUS
Installation, Operation and Maintenance Instruction; Landing Signal Officer Heads-Up Display (LSO HUD) Console System MK-1 MOD 0 and HUD Console Test Simulator A/E-24T-45 NAVAIR 51-60-9	Hard copy	10		On board
Illustrated Parts Breakdown; LSO HUD Console System MK-1 MOD 0 and HUD Console Test Simulator A/E-24T-45 NAVAIR 51-60-9.1	Hard copy	10		On board

PART V - MPT MILESTONES

COG CODE	MPT MILESTONES	DATE	STATUS
NAVICP	Established MOVLAS NSD	9/69	Completed
DA	Developed LSO HUD ILSP	4/80	Completed
TSA	Began FLOLS MK-6 MOD 3 Initial Training	3/85	Completed
TSA	Began LSO HUD Initial Training	3/85	Completed
TSA	Delivered FLOLS TTE	7/85	Completed
TSA	Delivered LSO HUD TTE	7/85	Completed
NAVICP	Established ILARTS NSD	6/87	Completed
DA	Developed FLOLS ILSP	12/87	Completed
NAVICP	Established FLOLS NSD	5/88	Completed
TSA	Began Flight Deck Centerline LSFS On-Sight Initial Training	8/88	Completed
NAVICP	Established Flight Deck Centerline MSD	1/93	Completed
NAVICP	Established Flight Deck Centerline NSD	10/93	Completed
DA	Developed ILARTS ILSP	1/94	Completed
DA	Developed IFLOLS ILSP	8/94	Completed
TSA	Delivered WMIS Technical Training Equipment	10/94	Pending
TSA	Began Initial Training for WMIS	3/95	Completed
TSA	Delivered WMIS Curricula Materials	4/95	Completed
TA	Began Follow-On/Replacement Training for WMIS	10/95	Completed
PDA	Began Analysis of Manpower Personnel, and Training Requirements	1/96	Completed
DCNO/DMSO/CMS SPONSOR	Developed Program Manpower and Training Resource Requirements	2/96	Completed
TSA	Developed MOVLAS Maintenance Plan	4/96	Completed
TA	Began Follow-On/Replacement Training	5/96	Completed
DA	Promulgated Update Draft NTP to ALCON for Review and Comment	6/96	Completed
PDA	Submitted Proposed NTP to OPNAV	7/96	Completed
DCNO (MPT)	Approved and Promulgated NTP	8/96	Completed
DA	Developed LRLS ILSP	9/96	Completed
TA	Began IFLOLS TECHEVAL and OPEVAL Initial Training	9/96	Completed
NAVICP	Awarded LRLS Contract	12/96	Completed
NAVICP	Established WMIS Type F Hi-Shock NSD	2/97	Completed
DA	Began IFLOLS TECHEVAL	3/97	Completed
DA	Developed VISUAL ILSP	6/97	Completed
DA	Validated IFLOLS MRCs	8/97	Completed

PART V - MPT MILESTONES

COG CODE	MPT MILESTONES	DATE	STATUS
TSA	Began LRLS TECHEVAL Training	9/97	Completed
TSA	Developed Preliminary Draft NTSP	11/97	Completed
TSA	Updated LRLS ILSP	12/97	Completed
DA	Completed IFLOLS OPEVAL	3/98	Completed
TA	Approve updated IFLOLS ILSP	10/98	Completed
NAVICP	Receive IFLOLS Production Approval	5/99	
DA	Complete LRLS TECHEVAL	5/99	
NAVICP	Receive LRLS Production Approval	5/99	
TSA	Modify LSO Simulators to Include LRLS	6/99	
APML	Begin LRLS Follow-On Training	6/99	
TSA	Develop LRLS IC PQS	6/99	
NAVICP	Begin LRLS Deliveries	10/99	
NAWC AD	Update IFLOLS Operation and Maintenance Manual	12/99	
APML	Conduct LRLS Initial Training for NATTC Instructors, CAFSU Representatives, and Engineering Personnel	2/00	
NAVICP	Establish LRLS MSD	3/00	
NAVICP	LRLS IOC	3/00	
TSA	Formal LRLS Operation and Maintenance Manual Available	3/00	
NAWCADLKE	Validate LRLS MRCs	5/00	
NAVICP	LRLS Delivery of Production Systems Begin	5/00	
NAVICP	Establish LRLS NSD	5/00	
NAVICP	Deliver Operational LRLS to NATTC Lakehurst	7/00	
NAVICP	Deliver IFLOLS TTE	10/00	
NAVICP	Begin IFLOLS Deliveries	10/00	
NAVICP	Establish IFLOLS IOC	10/00	
NAVICP	Complete LRLS Deliveries	12/00	
NAVICP	Establish IFLOLS MSD	6/01	
APML	Begin IFLOLS Follow-On Training	6/01	
TSA	Develop IFLOLS IC PQS	10/01	
NAWCADLKE	Develop an IFLOLS Depot Level Manual	10/01	
NAWCADLKE	Availability of VISUAL IPB	10/01	
NAWCADLKE	Validate VISUAL MRC	TBD	
NAVICP	Complete IFLOLS Deliveries	4/02	
NAVICP	Establish IFLOLS NSD	6/02	

PART V - MPT MILESTONES

COG CODE	MPT MILESTONES	DATE	STATUS
DA	Begin VISUAL TECHEVAL	7/02	
DA	Begin VISUAL OPEVAL	9/02	
NAVICP	Establish VISUAL IOC	11/03	
NAVICP	Establish VISUAL MSD	12/04	

PART VI - DECISION ITEMS/ACTION REQUIRED

DECISION ITEM OR ACTION REQUIRED	COMMAND ACTION	DUE DATE	STATUS
FTC San Diego, California and FTC Norfolk, Virginia, have not received WMIS TTE to begin instruction in a WMIS lab for course A-651-0047, Propulsion Alarms and Indicating Systems Maintenance.	PMA251	4/95 *	Pending funding
SSC Great Lakes, Illinois, is awaiting the following ILARTS support equipment: ECSS calibration pole PN# 526602-1 and Extender board (for Interface enclosure 627310-1) PN# 522705-1.	PMA251	12/97	Pending

Note: FTC Norfolk and FTC San Diego already have curricula materials. They have been waiting for TTE since April 1995. When funding information for TTE becomes available it will be incorporated into NTSP updates.

PART VII - POINTS OF CONTACT

NAME / FUNCTION / ACTIVITY, CODE / INTERNET EMAIL	TELEPHONE NUMBERS
CAPT Don Watkins Aircraft Carrier Program Sponsor CNO, N885D watkins.donald@hq.navy.mil	COMM: (703) 697-9359 DSN: 227-9359 FAX: (703) 695-7103
CAPT Thomas Vandenburg Head, Aviation Technical Training Branch CNO, N889H vandenburg.thomas@hq.navy.mil	COMM: (703) 604-7730 DSN: 664-7730 FAX: (703) 604-6939
AZC Scott Dean NTSP Manager CNO, N889H7 dean.scott@hq.navy.mil	COMM: (703) 604-7714 DSN: 664-7714 FAX: (703) 604-6939
CDR Brian Mack Aviation Manpower CNO, N122C1 N122C1@bupers.navy.mil	COMM: (703) 695-3247 DSN: 225-3247 FAX: (703) 614-5308
Mr. Robert Zweibel Training Technology Policy CNO, N75B zweibel.robert@hq.navy.mil	COMM: (703) 614-1344 DSN: 224-1344 FAX: (703) 695-5698
CDR Earnest. Hawkins Aviation NTSP Manager CINCLANTFLT, N-721 hawkinsel@clf.navy.mil	COMM: (757) 836-0101 DSN: 836-0101 FAX: (757) 836-0141
Mr. Robert Long Deputy Director for Training CINCPACFLT, N70 u70@cpf.navy.mil	COMM: (808) 471-8513 DSN: 315-471-8513 FAX: (808) 471-8596
Mr. Victor Brown Assistant Program Manager, Logistics NAVAIRSYSCOM, PMA251L brownvl@navair.navy.mil	COMM: (301) 757-6814 DSN: 757-6814 FAX: (301) 757-6800
CAPT Larry Knolhoff VLA Program Manager NAVAIRSYSCOM, PMA251 knolhoffle@navair.navy.mil	COMM: (301) 757-6825 DSN: 757-6825 FAX: (301) 757-6800
Mr. Claude Jones Deputy Program Manager NAVAIRSYSCOM, PMA251 joneshc2@navair.navy.mil	COMM: (301) 757-6822 DSN: 757-6822 FAX: (301) 757-6800

PART VII - POINTS OF CONTACT

NAME / FUNCTION / ACTIVITY, CODE / INTERNET EMAIL	TELEPHONE NUMBERS
CAPT Jerry Rea Enlisted Assignments Division Director NPC, NPC-40 p40@persnet.navy.mil	COMM: (901) 874-3539 DSN: 882-3539 FAX: (901) 874-2647
LCDR Steve Benner Branch Head, Engineering/Hull Enlisted Rating NPC, NPC-402 p402@bupers.navy.mil	COMM: (901) 874-3602 DSN: 882-3602 FAX: (901)
EMCS Donald Whitt CNET Training Program Coordinator CNET, ETE332 emcs-donald.whitt@smtp.cnet.navy.mil	COMM: (850) 452-8949 DSN: 922-8949 FAX: (850) 452-4401
Ms. Kimberly Reymann IPT Leader NAWCADLKE, 1.1 reymann@lakehurst.navy.mil	COMM: (735) 323-1924 DSN: 624-1924 FAX: (732) 323-4029
Mr. Robert Dresser FLOLS/ LSFS/ LSO HUD/ MOVLAS/ LRLS Program Manager NAWCADLKE, 11X613B dresser@lakehurst.navy.mil	COMM: (732) 323-4393 DSN: 624-4393 FAX: (732) 323-4029
Mr. Kurt Hartig ILARTS/HOSS Program Manager NAWCADLKE, 11X611B hartig@lakehurst.navy.mil	COMM: (732) 323-1696 DSN: 624-1696 FAX: (732) 323-4029
Mr. John Glenn WMIS Program Manager NAWCADLKE, 11X614B glenn@lakehurst.navy.mil	COMM: (732) 323-2931 DSN: 624-2931 FAX: (732) 323-4029
Ms. Terri Kostbar ALRE Training Specialist NAWCADLKE, 314100B kostbar@lakehurst.navy.mil	COMM: (732) 323-1841 DSN: 624-1841 FAX: (732) 323-7233
Ms. Cynthia Strum IFLOLS/ LRLS/ ILARTS Logistics Planner NAWCADLKE, 314100B strum@lakehurst.navy.mil	COMM: (732) 323-1825 DSN: 624-1825 FAX: (732) 323-7233
Mr. Michael Besante LRLS/ IFLOLS/ WMIS/ LSO HUD/ ILARTS Systems Engineer NAWCADLKE, 48J300B besantm4@lakehurst.navy.mil	COMM: (732) 323-1811 DSN: 624-1811 FAX: (732) 323-1811

PART VII - POINTS OF CONTACT

NAME / FUNCTION / ACTIVITY, CODE / INTERNET EMAIL	TELEPHONE NUMBERS
Mr. Jeffery Sontag FLOLS/ LSFS/ LSO HUD/ MOVLAS/ WMIS Logistics Planner NAWCADLKE, 314100B sontag@lakehurst.navy.mil	COMM: (732) 323-1834 DSN: 624-1834 FAX: (732) 323-7233
Mr. John Zirkel Marking and Lighting Team Leader NAWCADLKE, 11X612B zirkeljs@lakehurst.navy.mil	COMM: (732) 323-4044 DSN: 624-4044 FAX: (732) 323-4029
LT Gary Hubbard OIC, USN LSO School NAS Oceana, LSO School lsoschool@airlant.navy.mil	COMM: (804) 433-2515 DSN: 433-2515 FAX: (804) 433-2911
ACCM Howard McGrath Training Manager NAVAIRSYSCOM, PMA-205-3B1 mcgrathhj@navair.navy.mil	COMM: (301) 757-8126 DSN: 757-8126 FAX: (301) 757-6945
Mr. Phil Szczyglowski Competency Manager NAVAIRSYSCOM, AIR 3.4.1 szczyglowspr@navair.navy.mil	COMM: (301) 757-9182 DSN: 757-9182 FAX: (301) 342-4723
ATCS David Morris NTSP Coordinator NAVAIRSYSCOM, AIR 3.4.1 morrism@navair.navy.mil	COMM: (301) 757-9173 DSN: 757-9173 FAX: (301) 342-4723
ATC Terry Neuman MPT Analyst (NTSP Author) NAVAIRSYSCOM, AIR 3.4.1 neumante@navair.navy.mil	COMM: (301) 757-9197 DSN: 757-9197 FAX: (301) 342-4723